

THE JOURNAL

OF THE

Department of Agriculture

OF SOUTH AUSTRALIA.

No. 7. FEBRUARY 15, 1924. Vol. XXVII.

Published Monthly by the Department of Agriculture.

Edited by H. J. FINNIS.

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All communications to be addressed:
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JOHN COWAN,
Minister of Agriculture.

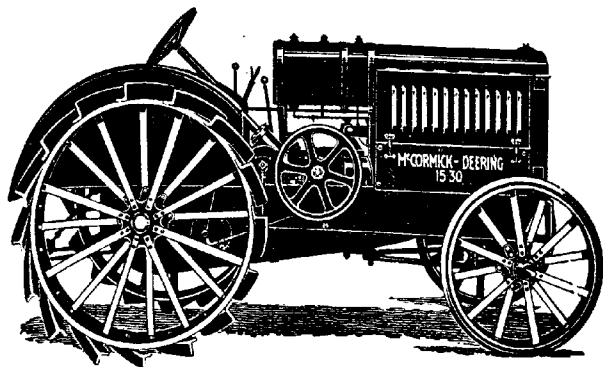
POINTS FOR PRODUCERS.

An American Visitor.

An officer of the Farm Bureau of the United States of America (Miss Marion Hardy) spent a few days in South Australia last month. During her stay in this State, Miss Hardy interested herself particularly in the work of the Agricultural Department, more especially the activities of the Agricultural Bureau. On Saturday, January 12th, she visited the Roseworthy Agricultural College, and on the following Monday visited Williamstown in company with the Secretary of the Advisory Board of Agriculture (Mr. Harold J. Finnis), with the idea of gaining first-hand knowledge of the working of country Branches of the Agricultural Bureau in this State. Under the presidency of Mr. E. Bain, a joint meeting of the Williamstown men's and women's Branches was held. The business was carried on in the usual way, the programme consisting of a paper by the Hon. Secretary (Mr. George Brown) on the "Export of Plums." This was discussed by the meeting, and then Miss Hardy addressed the gathering. After having dealt briefly with the organisation of the Farm Bureau movement of the United States of America, and the nature of the problems it was endeavoring to solve, she explained the scope of the work in which she was more particularly engaged, namely, the development of Farm Bureaux, or "organised communities," in the State of Vermont. "Family membership" was the rule in these communities. Amongst the women members, work consisted largely of the dissemination of information on domestic science problems, sanitation, and home dressmaking, a special feature being made of home to home visits by members for the purpose of gleanings information on labor-saving devices, kitchen arrangement, and, by no means least, the promotion of social intercourse. Amongst the children, which were organised into clubs, special "projects" were undertaken each year. Boys and girls, ranging in ages from 10 to 16 years, formed calf clubs, poultry clubs, pig clubs, or clubs designed especially to study and treat of other similar agricultural undertakings. Each club met just as did the older communities, a special feature being the annual achievement day, in which the work for the year was displayed and discussed. Miss Hardy's remarks were very well received by the audience, and on the motion of Mr. J. S. Hammat, seconded by Mr. H. J. Spencer, she was heartily thanked for her attendance. During her stay in Williamstown, Miss Hardy was the guest of Mrs. J. S. Hammat, Hon. Secretary of the Williamstown Women's Branch of the Agricultural Bureau.

Dairy Improvement Act.

Regulations under the Dairy Cattle Improvement Act of 1921 empower the Minister of Agriculture to grant, subject to certain conditions, subsidies of 60 per cent. of the purchase price of dairy bulls purchased at public auction sales arranged by the Government, or by private treaty. The first public auction arranged under the provisions of this legislation took place at the Royal Agricultural and Horticultural Society's Show in September last. Arrangements are now being made by the Department of Agriculture for a second sale, which it is proposed to hold at Murray Bridge, probably during March.



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Murray Bridge High School.

The attention of farmers who have sons eligible to enter a High School is drawn to the special course of work provided at the Murray Bridge High School. In addition to a general education, such as is given by most country High Schools, scholars have the opportunity of doing special work of an agricultural nature. The aim is to give an agricultural bias to those lads who intend becoming primary producers. With this end in view, the following studies are included in an elementary form:—(1) Chemistry and Botany, especially as related to agriculture; (2) Agricultural Study in simple form of soil, tillage, water, and irrigation; (3) Horticulture—planting, training of young trees, pruning, budding, grafting, spraying, storing, and preserving of fruit; (4) Natural Science—value of our native birds, insect life (various stages), remedies for destructive insects, fungus diseases and spraying; (5) Milk Testing; (6) Practical work in school garden and irrigation plot.

Herd Testing in the Hills.

There is a prospect of a herd testing society being established in the Hills District. During February the Assistant Dairy Expert (Mr. H. J. Apps) visited Mount Barker and Tweedvale, and he found local dairymen keenly interested in herd testing. Two members of the Mount Barker Branch of the Agricultural Bureau have undertaken to make a canvass of the district with the object of securing sufficient members to establish the society forthwith. When in this district Mr. Apps took an opportunity of addressing the local Branch of the Agricultural Bureau, and gave a demonstration of milk testing. Whilst at Tweedvale, Mr. Apps inspected the dairy herds of Messrs. Dearman Bros. and Sickerdick, and with the members of the local Branch of the Bureau, discussed the various points of judging cows and bulls. In the evening, Mr. Apps addressed a meeting of the Bureau.

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INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies furnished by Mr. A. H. ROBIN, B.V.Sc., Stock and Brands Department.]

Hon. Secretary, Mount Pleasant Agricultural Bureau, reports several ewes with blowing bag protruding; some of them about 6 in. The ewes had not been in lamb.

Reply—Prolapse (or protrusion) of the uterus (or breeding bag) is nearly always incidental to lambing, occurring immediately (or at the most within two days) after the lambs are dropped. With respect to empty ewes, it is a rare accident, as it must be by virtue of the anatomical arrangement of the breeding organs. Two other conditions exist with which it could easily be confounded at first sight without a complete anatomical knowledge of the different organs, namely, prolapse of the vagina (or back passage) and prolapse of the bladder. Circumstances which would be apt to bring about any of these accidents (not following on lambing) would be fatness, depasturing over steep, hilly, or rough country, sudden violent exertion and straining hard (as might accompany constipation or diarrhoea). These circumstances suggest their own remedy as regards the removal of the cause operating to produce the accident. Treatment to be adopted to reduce the protrusion of the organs consists in first cleaning carefully, but thoroughly as possible, with warm water and very weak antiseptics, the protruding organs, and subsequent manipulation of them with clean oiled hands. Lay the animal on its back, and hold it up by the back legs, so that the hindquarters are raised well up above the level of the forequarters. By gentle manipulation attempts should be made to return the protruded organ to the inside through the tip of the vulva. In protrusion of the vagina this is all that is required. In dealing with the uterus or bladder, the finger should be introduced into the back passages, and the organ pressed through the neck of the uterus or bladder, as the case may be. To completely restore these organs to their proper position and avoid recurrence of the trouble, they can then be filled up with lukewarm boiled water in which a little boracic acid has been dissolved. Still holding the sheep up by the back legs, the weight of this introduced solution will complete the restoration of the organs perfectly into proper position. When the sheep is released and regains its feet, this solution will soon be passed out. Subsequently, to prevent recurrence of the trouble, as sometimes happens, the animal should be kept very quiet and, if possible, in such position that its hindquarters are somewhat raised. If the animal strains, she may be kept quiet by giving a small dose or two of laudanum. Prolapse, following on lambing, is treated in the same way.

"T. F." New Hindmarsh, has cow with stiff hindquarters. On rising from the ground the animal drags her hind legs. After walking lamely for some little time a distinct click is heard, and the cow is able to walk properly.

Reply—The cow is suffering from a recurring luxation (or dislocation) of the patella, the small bone which lies at the front of the stifle joint (and which corresponds to the kneecap of man). This condition arises when the cow is lying down, or perhaps during her attempt to rise, and causes the stiffness of the whole limb. After a while it spontaneously becomes reduced (when the "click" you

mention takes place), and she is then able to move the limb freely again and walk normally. The best treatment you can adopt is to confine the cow for a few days in a stall, so that she is unable to lie down, and apply a good smart blister over the front and sides of the affected stifle joint.

Hon. Secretary, Agricultural Bureau, Shoal Bay, K.I., asks is a person liable for selling sheepskins carrying a registered brand, without the ears being left on the skin.

Reply—A person would not be liable for selling sheepskins bearing a registered brand if the ears have been cut off, unless it was done for some unlawful or improper purpose.

"G. P. S.," Pygery Siding, reports filly pastured in grass paddock. Turns the body to the off side, and walks in a circle, is "tucked up," and grinds her teeth. Inquirer also asks the correct dose of nux vomica to administer to horses.

Reply—If you can get hold of an equine mouth-gag, put it on the filly and make a thorough examination of her mouth. The continual grinding of teeth and loss of appetite may be due to some irregularity in connection with the teeth, &c. If you can find nothing in the mouth to account for her condition, give her a mild dose of physic (aloes 3drachms, calomel 1drachm, nux vomica 1drachm), and then give her one of the following powders night and morning for some days until she shows signs of returning appetite:—Pulv. nux vomica 1drachm, pulv. rad. gentian, 3drachms. Mix the powder with a spoonful of treacle to a sticky paste, and smear it over her back teeth and tongue with a smooth flat stick. Give the powder quarter of an hour before feeding. Tempt her appetite with good wholesome food. Of powdered nux vomica, horses can be given from one to two small teaspoonsful. Of tincture nux vomica, the dose is from two or three table spoonsful.

"J. D.," Mount Bryan East, asks cure for blindness in sheep.

Reply—If possible, separate the affected sheep from the healthy, and keep them apart, because there is risk of the infection spreading by flies and other means. Keep the affected ones in a shady position. Bathe the eyes with a warm boracic acid solution, and put a few drops of the following lotion into the eyes so that it runs all over the eyeballs:—Zinc sulphate 2 drams, boracic acid 1 dram, distilled water 1 pint. Repeat this treatment, if possible, three or four times daily. The condition may, under this treatment, clear up fairly promptly, but it can also be fairly persistent in spite of the best of care and treatment.

"E. E. R.," Geranium, reports mare eight years old with large swelling on fetlocks. The mare is extremely lame.

Reply—Prepare the mare for a day with warm bran mash, and then give a good dose of physic (aloes ball) on an empty stomach. Feed only on mash until the physic has worked. Clip the hair over the fetlocks, and apply to each—all over the swelling—a good strong red blister, rubbing it well in for 15 to 20 minutes. (Take particular care to see that none of it gets down into the hollow of the heels.) The day after the blisters are applied, dress the fetlocks with warm water, soap, and antiseptic; rupture any water bags that have formed to let the fluid escape, and finally dress all over with vaseline or bland oil. Turn the mare out for a spell. If necessary, repeat the blistering in a month's time.

"R. J.," Port Pirie, has draught gelding, eight years old, with large swelling on inside of near hock.

Reply—The horse is suffering from a strained condition of the hock joint, and the swelling is due to an increased quantity of joint oil which has formed around the joint as a result. This condition usually exists without any accompanying lameness, but if aggravated by keeping the animal in work, lameness may be set up. In order to prevent this untoward happening, and to give the injured part every chance to recover and the swelling subside, you should turn him out for a good spell, first applying a blister all over the joint.

Hon. Secretary, Black Springs Agricultural Bureau, reports mare with foal two months old. The near front leg swelled and then burst; it decayed away, exposing the muscles. Eventually the mare had to be shot.

Reply—The condition probably arose as the result of some external injury of the affected limb—infection through a small punctured wound would be sufficient. It would appear that the condition should have been amenable to treatment if it had been attempted and pursued along right lines. The decay which took place

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would be caused by gangrene of the parts, due to the internal swelling interfering with the blood circulation. These decayed areas could have been excised with a knife or scissors, and if careful antiseptic treatment of the wounds had been carried out, supplemented by the internal administration of medicine to purify the blood of the animal, recovery should have been achieved. An early dose of physic, followed by repeated small doses of Epsom salts and salol, with green feed, would have probably been sufficient internal treatment.

Hon. Secretary, Agricultural Bureau, Wirrabara, asks for simple remedy for horses with itching heels.

Reply—If necessary, clip the hair covering the heels so as to expose them to treatment. Clean them out thoroughly with a good hoof brush to remove all scurf, scales, dirt, &c. Avoid the application of water to the heels; this will tend to aggravate. After thoroughly cleaning the heels in this way dash on frequently some of the following lotion:—Sugar of lead ½ oz., cold water 1 quart, vinegar ¼ pint. It may be necessary to supplement treatment by giving the animals a good dose of physic.

“W. N.,” Coomandook, reports sheep with sore mouths after eating Scotch thistles.

Reply—It is not much good dressing the scabs without removing the cause operating to produce them; in other words, you should remove the sheep from grazing on the thistles. A suitable dressing would be an ointment composed as follows:—Acid boracic 1 dram, zinc oxide 2 drams, glycerine 2 drams, lard 2 lb. Scotch thistles (*Onopordon acanthium*) have at the most only a slight fodder value, being best in the form of silage, which at the same time lessens the danger to stock fed on them, which exists on account of the spines.

Hon. Secretary, Agricultural Bureau, Marama, reports mare stiff and lame in the legs, “tucked up” appearance, hardly able to eat or drink. After drinking water runs out through the nostrils. Also treatment for horse with splint.

Reply—The mare appears to have had an attack of influenza, which has implicated the pharynx and larynx, and it would be due to soreness in this part that would account for the return of water and food through the nostrils. I recommend you to feed her on sloppy bran and chaff, with an occasional wet bran mash, and for a week put a handful of Epsom salts in the feed night and morning to get the bowels working well. Water her from a bucket only, in which an ounce of soda hyposulphite is dissolved, daily. Give her also a dose of Fowler's solution, 1 oz. twice daily for a period of 10 days, and then, after a rest for a week, repeat for a further 10 days. Rub the throat well with a good stimulating embrocation. (2) To treat the splint. Clip the hair closely over the part, and paint it daily with strong veterinary iodine (10 per cent.).

“H. J. K.,” Rodall, reports cow, four years old on third calf, calved two weeks ago. Has now developed two lumps on the udder just above the hind teats.

Reply—Apply repeated hot fomentations, taking care to avoid chilling of the udder after the fomenting is discontinued. After the fomentations, carefully dry the udder, apply a little camphorated oil, and massage over the area of the lumps, gently but firmly.

GREEN SCUM ON STILL WATER.

Black Springs Branch of the Agricultural Bureau asks—“What is the cause of green scum on still water, especially well water in a trough?”

The Lecturer in Plant Pathology at the University of Adelaide (Mr. Geoff. Samuel, B.Sc.) states that the green scum which frequently forms upon still water is due to the growth in enormous numbers of minute unicellular green alga (*Chlorophyceae*), a very simple form of plant life which always lives in water. It is found more frequently on stagnant well water, because well water often contains the mineral salts necessary for the growth of the alga in most sufficient concentration. Occasionally the growth of such an alga has been a source of trouble in large reservoirs. In these cases it was found that the most minute trace of copper sulphate prevented the growth of the alga, while not being sufficient to render the water unfit for human consumption.

TURKEY.

"P. R." Merildin, reports a turkey gobbler with difficulty in breathing, which continually opens its mouth in a sort of gasp; on the roof of the mouth is a hard white swelling; bird is very mooney.

The Poultry Expert (Mr. D. F. Laurie) replies:--The disease is a form of roup. The cure is to cut open the swelling, press out any cheesy or other foreign matter, and flood the cavity with a few drops of ordinary tincture of iodine. Also give daily to each affected bird a teaspoonful of olive oil, adding three drops each kerosine and eucalyptus oil. This disease, in several forms, is common in the north. All you can do is to watch carefully for signs, such as swellings on face, especially under the eye. If you have no iodine, but have permanganate of potash (sometimes called Condy's crystals), make a strong solution, and after operating dip the bird's head in and out three times slowly, so as to medicate the mouth parts. The iodine is, however, preferable, and is cheap also.

CUTWORMS.

Shool Bay Agricultural Bureau forwarded specimens of grubs that were destroying a member's potatoes. "They eat all the green leaves off, and then the potato seems to die right out. I have three kinds of potatoes growing in the same garden, but they only appear to eat the 'Carmens,'" the correspondent writes. "They are all in the same state of growth. These grubs just seem to live underneath the surface of the ground of a daytime, and come out of a night. I have repeatedly hoed the ground, but it does not seem to check them."

The Horticultural Instructor (Mr. Geo. Quinn) says:--"These are larvæ of a cutworm moth. If they are still existant use a bait made of paris green, say, 1 lb. to 4 lbs. bran, mixed into a paste with about a couple of pints of hot water, in which a few ounces of treacle or sugar have been dissolved. Scatter it along near the potato stems, and the grubs soon find it. After eating they may burrow underground, but as a rule they do not emerge again."

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SUBTERRANEAN CLOVER.

(Trifolium Subterraneum.)

[By W. J. SPAFFORD, Superintendent of Experimental Work.]

Subterranean clover has been known for a very long time in Central and Southern Europe. In those countries it is looked upon as a roadside weed, but it has been proved in South Australia to be an extremely valuable fodder plant for certain districts possessed of special natural conditions. In some types of soil it will produce more high-class fodder than will any of the well-known fodder plants. The credit for discovering, proving, and giving publicity to this really important fodder is practically wholly due to Mr. A. W. Howard, of Mount Barker, South Australia, whose efforts for a period of more than 30 years in this direction are now being appreciated in all of the States of the Commonwealth and in many other countries in the world. Mr. Howard's endeavors to popularise this fodder plant have been unceasing, and throughout he has acted in a most public-spirited manner, writing articles on the clover, supplying seed gratis to many parts of the world, and giving full advice on methods of handling, &c., to all who desired his help, and fortunately he now has the gratification of seeing the fruits of his labors, for thousands of acres in this State alone are carrying subterranean clover, all the States of the Commonwealth grow some of it, and requests for seed and information are being received in increasing numbers from almost all countries in the world having a temperate climate.

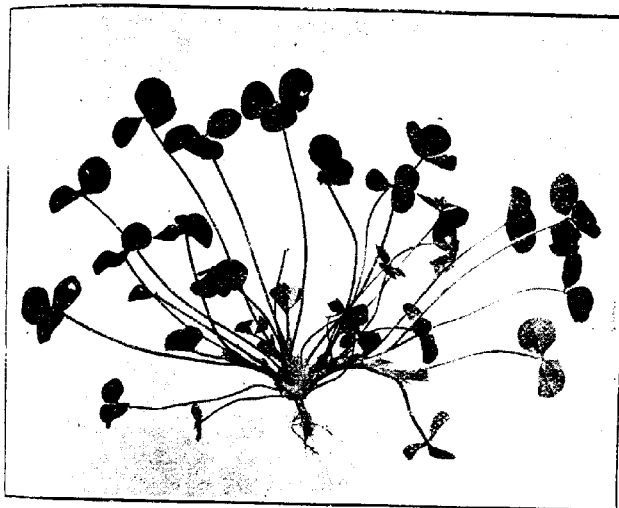
Because of its special characteristics, this clover has revolutionised the farming practices of some districts in South Australia and has converted many farms, where difficulty has been experienced to make profits by other methods, into valuable sheep farms, with much increased land values, and now earning direct profits. However looked at, the discovery of subterranean clover as a fodder plant has been a most valuable one for Australia; and on present appearances will be recognised as such in many other countries in the near future, and the labors of Mr. A. W. Howard warrant the thanks of the country.

DESCRIPTION OF THE PLANT.

Subterranean clover is a prostrate, softly woolly annual, all parts of which are covered with fairly long, soft hairs. The three leaflets forming each leaf are carried on a long stalk, and each leaflet is heart-shaped and faintly toothed at the summit. The two small appendages growing at the base of the leaf stalks, although bluntly pointed, are almost oval in shape. Clusters of three or four small flowers of a creamy to pinkish color are produced on comparatively short stalks which spring from the axils of the leaf stalks, and immediately after flowering the stalk carrying the cluster of flowers turns downwards and grows until the seed head is pushed below the surface of the soil. On penetrating the soil the parts of the flower head surrounding the fertile flowers grow sufficiently to "anchor" the seed

head in the soil. Each fertile flower produces a one-seeded pod. Although an annual plant, the provision for burying most of its seed makes this clover equivalent to a perennial, and when once established it is practically permanent.

An individual plant in good conditions and given room for development will often completely cover the ground enclosed by a circle 6ft. in diameter, the central part of the circle, about 3ft. across, attaining up to 18in. or so in height, with the outer ring consisting of a mass of runners lying on the surface of the soil. Where a good stand of plants exists in fields which have been well supplied with phosphatic fertilisers, it is not unusual to have the whole land covered with a mass of luxuriant growth, 15in. to 20in. in height, the bottom 6in. or so consisting of a thick body of intermingled stalks, whilst above that is mainly leaf growth.



SUBTERRANEAN CLOVER—A Young Plant Before Runners have Formed.

Photo. by E. W. Pritchard.

CLIMATIC REQUIREMENTS.

In South Australia subterranean clover seed germinates with the first autumn rains which are heavy enough for the purpose and which usually occur in April or early May. The young plants make some growth during the winter period, and by the end of August will have produced a thick mass about 4in. in height. When the warm weather of spring arrives they grow very rapidly, and remain green and continue growing until really hot weather is experienced, when they dry up. The possession of this characteristic of making slow growth in winter, rapid growth in spring, and maturing when the hot weather arrives, means that full returns from this clover can only be secured in those districts having a long spring period, and great success will not be obtained with the crop in those districts having a short growing period. In South Australia most of that part of the

country which receives more than 20in. of average annual rainfall has a sufficiently good climate to grow subterranean clover well. In a general way this plant requires a temperate climate with fairly heavy rainfall and long growing period to give full returns of fodder, and as it will withstand a fair amount of excessive wet and the ordinary cold of winter really well, maximum results are secured in those districts receiving from 30in. to 40in. of average annual rainfall, and a growing period of about nine months between the autumn rains and the really hot, dry weather of summer, providing always that the seed germinates before the cold weather of winter arrives.

SOIL REQUIREMENTS.

Subterranean clover appears to be able to accommodate itself to almost all types of soil, and given suitable climatic conditions and sufficient phosphoric acid will grow well in calcareous and in sour soils, in most clay soils, in all sands, and in peaty soils, but gives best returns in good, well-balanced loams possessed of good, natural drainage. In this State one of the few types of soil in which the clover does not thrive well, is the black, clayey soil forming part of some of the 'crab-hole' land of the South-East, but the extent of the country containing this soil type is so limited that it is not worth much consideration.

Much of the value of this clover depends on the fact that, provided phosphoric acid is supplied to the soils, it will grow extremely well on really "sour" soils, whether they be poor whitish sands, clayey soils containing much ironstone, or really fertile loams. The poorer types of "sour" lands are usually fairly plentiful where heavy annual rainfall and temperate climate are the rule, and it is not an easy matter to produce profits from the ordinary well-known crops on such soils, but subterranean clover flourishes in them to the exclusion of practically all other plants.

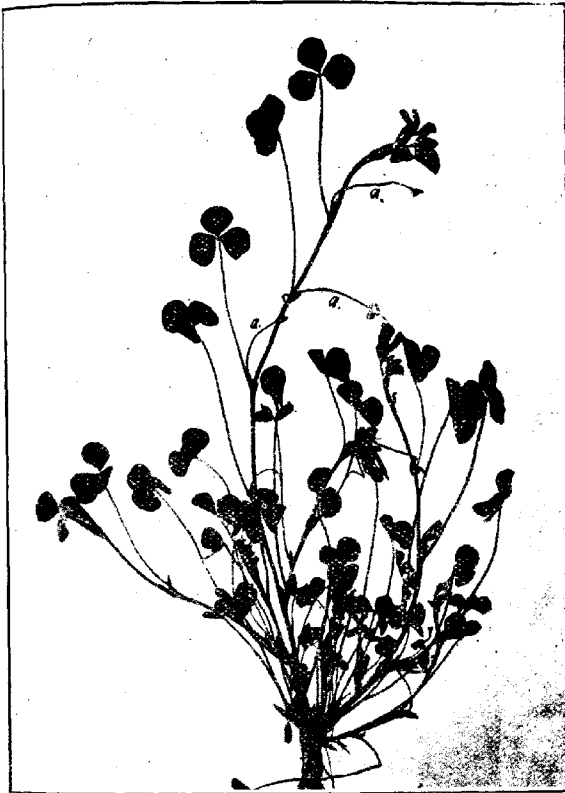
TIME OF SEEDING.

Where this clover has become established the seed germinates with the autumn rains, makes good root growth during the cold winter period, but does not make strong stem and leaf growth unless the winter is very mild and warm, and on the approach of the warm weather of the spring season commences to make strong growth, and continues to make rapid growth until maturity is reached. If the young plants have not started before the cold weather arrives, the crop does not make the luxuriant stand which follows an early germination, except when an exceptionally long drawn-out growing season is experienced, and so for average seasons it is essential to seed subterranean clover in the autumn, and, if possible, to have the land prepared beforehand. The seed should be sown on the first autumn rain which is sufficiently heavy to lead to the germination of the seed.

METHOD OF SEEDING.

If maximum returns from subterranean clover are being looked for, good soil preparation is necessary before the seed is sown. The land should be ploughed sometime between October and the following

March, and by the middle of April should be worked down to a really fine seed bed. The phosphatic fertiliser to be used with the crop should be now drilled into the land. As soon as the land is sufficiently moist to germinate the seed, the seed to be used should be mixed with some material such as bonedust or sieved earth (not sand) to act as a carrier, and the mixture can be distributed from the manure box of an ordinary seed drill, being careful not to allow the hoes to pene-



SUBTERRANEAN CLOVER.—Portion of Young Plant Producing Runners, and Commencing to Flower. (a) Flowers.

[Photo, by E. W. Pritchard.]

trate the soil to too great a depth. In this connection it would be much better for the seed to be allowed to fall from the drill tubes on to the surface of the land than for it to be sown too deeply. In "heavy" soils shallow seeding is absolutely essential, whilst in sandy soils less risk of a bad germination is taken, but even then $\frac{1}{2}$ in. should be taken as the maximum depth.

Superphosphate can be used as the "carrier" with which the seed is mixed, but it must be remembered that there is a danger of the germination of the seed being spoiled by contact with superphosphate. It is only safe to use superphosphate for this purpose (a) when the land is sufficiently moist to be in good germinating condition, or (b) when the land is quite dry, and on no account should the mixture be left for more than three hours before it is put into the land.

Broadcasting the seed after having drilled in the fertiliser generally ensures a good, regular germination, but much more seed is required, and the quantity of seed used per acre being so small makes the even distribution of it rather difficult. If broadcasted on the surface, either by hand, with a broadcasting machine, or from the tubes of a seed drill, it should be covered by pressing it into the soil with a land roller, or, failing this, by going over the land with "brush" harrows, because most of the other farm implements tend to bury this small seed too deeply.

Where full returns are not expected the first year it can be seeded with some other crop, and on low-priced land of light texture it is sometimes economical to treat the crop in this way. When an oat crop or a wheat crop is being seeded, a small quantity of seed can be mixed with the fertiliser being applied to the cereal. Many of these seeds will germinate and the plants will grow in the cereal crop, producing a lot of seed for the next year, and when a good germination has resulted and the stubble has not been too heavily grazed a very fair stand of clover is often the result.

In soils of light texture quite fair returns can be secured with this clover by seeding into the land without any preparatory cultivation, providing that the land is loose enough for the hoes of a seed drill to make shallow furrows when run over the ground. In this case, to give the clover plants a chance to compete with the other plants occupying the land, the seed should be put in before the first autumn rain while the soil is still dry, and plenty of phosphatic manure must be used. With this treatment a really good stand cannot be expected until the second or third year after seeding.

RATE OF SEEDING.

To establish this clover properly the year of seeding, on land that has been thoroughly prepared, at least 6lbs. of seed per acre are necessary, and best results are likely to be secured by increasing this amount nearer to 10lbs. per acre. On low-priced land, where the seeding is to be done in a cereal crop, about 2lbs. per acre will be sufficient. Where seeding without previous soil cultivation is to be practised, on light textured soils, 4lbs. to 6lbs. of seed per acre are necessary.

MANURING THE CROP.

As with all plants which make rapid, luxuriant growth, subterranean clover gives best returns when liberally supplied with all the necessary plant foods, but perhaps better than most other cultivated plants it appears to have the power of extracting from almost any type of soil its requirements of other plant foods when its needs as regards phosphoric acid are adequately met. In all soils found in those parts of South Australia which have suitable climatic conditions for the growth of this crop, with the exception of more or less white sands, the

equivalent of 2cwts. superphosphate (36 per cent.) per acre per year is sufficient fertiliser to apply to this clover to produce somewhere near to maximum returns. On poor, sandy land the addition of a potassic manure, say, 1cwt. kainit per acre per year, would be a marked advantage.



SUBTERRANEAN CLOVER—Portion of Young Plant Showing the Flowering and Formation of Seed Soon After the Runners Leave the Crown. This Production of Seed Continues for Months After the First Seeds are Formed. (a) Seed Burrs, Each Containing Three or Four Seeds; (b) Flowers.

Photo. by E. W. Pritchard.

At present prices the cheapest way to supply the necessary phosphatic fertiliser would be to dress the land at the rate of 1cwt. superphosphate (45 per cent.) and 10cwts. finely ground raw rock phosphate

(82 per cent.) per acre once every 12 years; this would prove much more satisfactory than applying 2cwts. superphosphate (36 per cent.) or 180lbs. superphosphate (45 per cent.) per acre every year.

It must be remembered that it is almost impossible to grow subterranean clover successfully unless plenty of phosphatic fertiliser is applied to the crop, and even in the best of soils a very marked improvement to the clover crop follows every application of phosphate. All fertilisers applied to this crop should be put into the land in the autumn before the first rains have fallen, say, in March or early April.

USES OF THE CROP.

Subterranean clover is mainly grown to be grazed in the green state, but it can be converted into a very attractive and palatable hay, and is a really good "dry" feed if left to mature in the field before being fed.

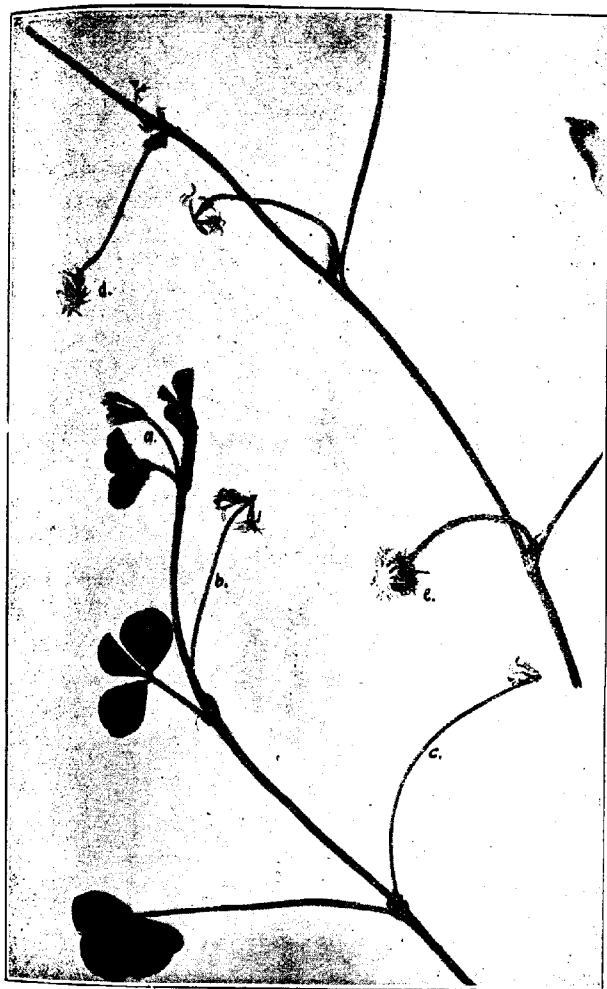
As green feed it tends to "blow" the ruminants (cattle and sheep, if they be turned on to it when wet, particularly if the animals have left a different type of fodder, but this is a recognised disadvantage of practically all leguminous fodders when green, and the danger is eliminated, or at all events lessened, by allowing the livestock to become accustomed to it gradually. In this stage it is a remarkably good milk producer with cows, a great fattener of cattle, sheep, and horses, and pigs do really well on it.

A good deal of care is necessary in converting the crop into hay, because it carries a very high proportion of leaf, and is at its maximum of growth before the hottest part of the summer has arrived, with the consequent danger of rain wetting the partly cured material, so sometimes necessitating much handling. When well cured, however, the hay is much relished by all farm livestock, and they will all fatten very readily when fed with it.

If allowed to stand in the field until dry it is still greedily eaten by livestock, and despite changes in the weather and much wetting and drying it remains a most useful and estimable feed, and in this respect is much more valuable than most other of our fodder plants if left to become dry. After livestock have eaten the leaves and dry stems, they continue to do well on this crop by searching for and devouring much of the rather enormous amount of seed left at and near the surface of the ground.

Besides producing much feed for the farm livestock, subterranean clover is a really good soil renovator, supplying much nitrogen collected by the bacteria living on its roots, and increasing the organic matter by leaves and stems dropped and trampled into the land whilst being grazed.

It is also a rather wonderful cleaner of the soil, for when growing well there are hardly any of the ordinary weeds found on our farmed lands which it will not choke right out. This is particularly noticeable in the case of the two almost useless weeds which occupy so much of the land where this clover will grow well, namely, sorrel and silver grass, both of which are choked out by the subterranean clover.



SUBTERRANEAN CLOVER—Pieces of Stalks Showing Development from Flowers to Seed. (a) Flowers Just Opening on Very Short Flower Stalk. (b) Petals of Flowers Just Drying—Note Increased Length of Flower Stalk. (c) Petals of Flowers Fallen—Flower Stalk Grown to Place Seed Burr in Soil. (d) Seed Burr Soon after Having Reached Soil Surface. (e) Seed Burr Enlarging, Showing Developed Seed Pods.

Photo. by E. W. Pritchard.]

HANDLING THE CROP.

Being possessed of prostrate stems and the power of burying its seed, subterranean clover is enabled to withstand much heavier grazing than will almost any other annual fodder crop, and for that matter more than many of the perennial fodders. Nevertheless, the more care shown with the crop the greater will be the grazing results. During the winter period the crop should not be fed too close, because the more growth left on the plants at this time the greater will be the root development, and so the more rapid and more bulky the growth made when the warm weather arrives. Once the rapid growth has started livestock can be turned on to the crop, remembering that best returns can only be secured if the crop is fed off rapidly and not too close, then the livestock removed and kept off until there is sufficient growth to be a good "bite" for the animals. Rapid feeding off and resting the pasture will give the greatest success and can only be attained in practice by having small fields, and given this, good subterranean clover should be capable of carrying the equivalent of 10 sheep per acre per year. At the end of the season the crop should not be fed off too close, because livestock soon learn to stamp for the seed, and if the land is laid bare and is then scratched by livestock, much seed will be washed from the soil should the first autumn rain be a heavy one.

If the clover fields are to receive an annual application of phosphate, rather than a heavy dressing occasionally, this should be applied in the autumn before the rains have started, say, in March or early April, either by running the drill with the hoes in the ground, or by broadcasting it on the surface and then harrowing it in.

Clover fields should be cultivated or harrowed each year to distribute the droppings of animals and the residues of the plants, and should be done in the autumn before sufficient rain has fallen to germinate any of the seed.

Where a rather thin stand of the clover exists, it should be only lightly grazed, leaving at the end of the season noticeable clumps of clover, and during the autumn should be harrowed two or three times to make sure that seed is dragged on to the bare patches.

If another type of crop is required from land growing subterranean clover it can be grown without any danger of eradicating the clover, and after one such crop ample seed of the clover is left to give a full stand in the next season. Two successive crops grown on clover land will not destroy all of the seed, but when left out the clover stand is naturally rather thin, and if a full crop is required a little clover seed should be sown after the second crop has been removed.

HARVESTING THE SEED.

No difficulty is experienced in harvesting seed which is to be used on the farm where grown. This is not so, however, for the collection and preparation of seed for market. Crops to be kept for seed are not grazed, or, if so, only lightly in the early spring, but are allowed to grow until quite mature. When ripe the crop is raked—with a horse rake if only a limited amount of seed is required, but with hand rakes if large quantities are desired. A horse rake will collect about one-half of the seed that would be gathered by hand rakes from



SUBTERRANEAN CLOVER—Portions of Stalks Showing General Hairiness of Plant, and the Development of Flowering parts to "Anchor" Seed in the Soil. (a) Flower Head in Bloom. (b) Flower Stalk Extended in its Search for the Soil Surface Immediately after Completion of Flowering. (c) Flower Head which has Just Touched Soil Surface, Showing Commencement of Characteristic Development of Parts of Flower Head which "Anchor" the Seed Burr to the Soil. (d) Seed Head, Showing Further Growth of Flowering Parts. (e) Fully Developed Seed Burr as "Anchored" to Soil.

Photo. by E. W. Pritchard.

a given area. If a power thresher is available, the raked up material is passed through it, which separates the seed burrs from the stems, but if no thresher is to be used the mass is passed through a chaff-cutter and the burrs winnowed from the stalks. Although some of the seeds are removed from their coverings by these methods they constitute only a comparatively small proportion of the burrs, and the mass would not be readily saleable. Still for one's own sowings these burrs, if well cleaned, are nearly as good as the hulled seed, and will be fairly evenly distributed from the manure box of the drill if mixed with bonedust, remembering that about three to four times as much unhulled seed is required as is needed if properly cleaned seed is used.

In preparing the seed for market the seed pods and burrs must be treated in a hulling machine, made specially for the treatment of this species of clover, in which all outer coverings of the seed are removed.

PESTS OF THE CROP.

Although subterranean clover has been grown as a fodder crop in South Australia for over 30 years now, the only pest doing noticeable damage to it is the Lucerne Flea (*Smynturus viridis*), and, although the hordes of this small insect which appear in the early spring play havoc with the crop, they are only present for a short while, disappearing as the weather warms up, and the crop very quickly recovers from their attack. A grazing crop of clover affected by this pest should be rapidly fed off by livestock, and if the insects were still present when sufficient growth had been made to enable livestock to graze it, the animals should again be put on the stand. It would pay to spray an affected crop, which was required for seed, using a weak solution of an arsenical spray, soap and tobacco spray, or an oil emulsion, being certain to apply the spray at night when the insects are active.

SUBTERRANEAN CLOVER IN MIXTURES.

The prostrate habit of subterranean clover and its strong and rapid growth lead to the smothering out of most other plants growing on the same land; still it will grow well in conjunction with any of the true grasses which start to make their spring growth a little sooner than does the clover. The best of the grasses for this purpose are Perennial Rye Grass and Italian Rye Grass, the latter requiring reseeding every second year. Of necessity a mixture of one of these grasses and the clover would only be attempted on really fertile soils, but on the poorer types of soil clover alone would be grown. Drained peat land or rich valley bottoms could be seeded with 4lbs. subterranean clover and 20lbs. Perennial Rye Grass per acre if a good mixture was required, and would produce an enormous quantity of really good pasture.

SUMMARY.

1. Subterranean clover, although known as a roadside weed in Europe for a long time, has been proved in South Australia to be a really high-class fodder plant, and this result is almost wholly due to the efforts of Mr. A. W. Howard, of Mount Barker, South Australia.
2. The power of burying its seed below the soil surface renders subterranean clover equivalent to a perennial.

3. Individual plants of subterranean clover will possibly cover the whole of a circle 6ft. in diameter, whilst a good stand of plants will cover the whole land with a dense mass of growth from 15in. to 20in. in height.

4. Subterranean clover requires a temperate climate with fairly heavy rainfall (25in. to 40in. average annual rainfall), and a long growing period (nine months between autumn rains and hot, dry weather), to produce maximum returns.

5. Almost all types of soil will produce subterranean clover well.

6. Much of the value of this clover depends on the fact that it will grow well on really "sour" soils, provided that plenty of phosphoric acid is supplied to the land.

7. The seed must be sown in time to germinate before the cold weather of winter sets in.

8. The seed can be drilled into the soil, or else be broadcasted on the surface and then worked into the land, but shallow seeding is essential. Good soil preparation is necessary if a proper stand is required in the first year, but the seed can under some circumstances be sown with another type of crop, or be drilled into "grass" land without previous cultivation.



SUBTERRANEAN CLOVER—Sod Cut from a Crop Showing Denseness of Growth Made by this Plant when Grown in Suitable Conditions.

Reproduced from "Fodder Crops for Australia," by Leslie H. Brunning.]

9. Six pounds to 10lbs. of seed should be used to give a full crop in the first year; about 2lbs. if sown with a cereal crop; and about 4lbs. to 6lbs. of seed if seeded into soil not previously prepared.

10. It is almost impossible to grow subterranean clover well in the soils of districts with temperate climates unless plenty of phosphatic fertiliser is used, and for high returns the equivalent of 2cwt. superphosphate (36 per cent.) per acre per year should be applied. At present the application of 1cwt. superphosphate (45 per cent.) and

10cwts. finely ground raw rock phosphate (82 per cent.) per acre once every 12 years is possibly the cheapest way to apply the phosphoric acid. All manuring should be done in the early autumn.

11. Subterranean clover can be used with advantage to livestock when green, as hay, or as "dry" feed.

12. This clover is a good soil renovator, collecting much nitrogen and increasing the organic matter content of the soil. It is also a good soil cleaner, choking out most of the ordinary farm weeds.

13. Subterranean clover should be grown in small fields so that it can be fed off rapidly, then rested until again ready for livestock. Clover fields should be cultivated or harrowed each year in the early autumn. Thin stands should be harrowed two or three times in the early autumn to ensure that seed is spread on to the bare patches. Clover fields will allow of a crop of another kind being grown for one year without affecting the clover stand.

14. In collecting seed the crop is raked up, threshed, and then hulled in a machine made specially for the purpose.

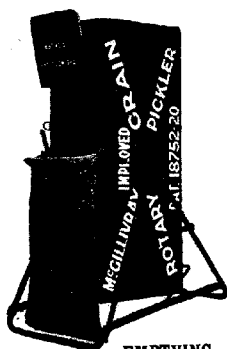
15. Lucerne Flea is the only pest doing much damage to the subterranean clover crops, but then only to "seed" crops, because the pastures are fed down heavily each time that they are attacked.

16. Subterranean clover will grow well in admixture with the rye grasses on those soils suitable to these grasses.

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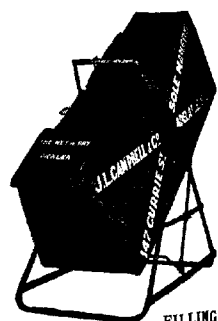


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THE STATE EXPERIMENT ORCHARD, BERRI.

Comprising an area of 79½ acres of irrigable land, together with 157½ acres of "dry" land situated above the channels, the State Experiment Orchard, Berri, is well known as the principal activity of the Department of Agriculture on the River Murray Irrigation Settlement in South Australia. The site of the orchard was reserved from the original Berri Irrigation Area in 1911. Experiments were formulated and planned by Mr. Geo. Quinn, Horticultural Instructor of the Department of Agriculture, but the orchard did not come under the direct control of that Department until 1917.

The irrigable portion of the area is watered from the main channels, representing lifts of 120ft., 70ft., and 40ft., respectively. The soil watered from the two channels first named is the typical sandy loam of the Murray Valley, varying from a depth of less than 12in., on some of the upper slopes to many feet in the slight valleys before the usual marly clay or limestone rubble is touched. The land irrigated from the 40ft. channel is mostly of a very different character. Beneath a thin stratum of drifted sand an extremely tenacious clay subsoil is encountered, which in its processes of cementation has become so compacted that it was almost impossible to induce reasonable percolation of water under ordinary irrigation methods, and one of the tasks undertaken has been to render these sublayers more pervious. Thus within the area comprising this station are to be found nearly all of the soil problems which confront the irrigator along the Murray Valley; shallow, drifts, and calcareous on the upland, deep sandy in the valleys or along the lower slopes, spreading out thinly on to stiff clay soils on the flats, bringing in their train and incidence the problem of superfluous water and concentrations of soluble salts under ordinary methods of tillage and irrigation.

INSPECTION BY ADVISORY BOARD.

This orchard was inspected by the members of the Board of Agriculture on Wednesday, January 23rd. The Minister of Agriculture (Hon. J. Cowan, M.L.C.) was present and officially welcomed to the orchard the party, which consisted of the Vice-Chairman (Capt. S. A. White, C.M.B.O.U.), Col. J. Rowell, C.B., Professor Arthur J. Perkins, Messrs. F. Coleman, H. Wicks, C. J. Tuckwell, A. M. Dawkins, H. J. Finnis (Secretary), and the Horticultural Instructor (Mr. Geo. Quinn). In his address of welcome, the Minister expressed his appreciation of the services gratuitously rendered the producing interests of the State by members of the Advisory Board, and intimated that he proposed strengthening the Board by the addition of new members. He had extended invitations to Mr. H. S. Taylor, of Renmark, to represent the Irrigation Settlements on the Board, to Mr. A. B. Feurcheardt, of Naracoorte, to represent the South-East, to Mr. P. H. Jones, of Pinnaroo, to represent the mallee farming areas, and to Mr. J. Wallace Sandford, who had previously occupied a seat on

the Board as President of the Royal Agricultural and Horticultural Society, to continue as a representative of the dairying interests. He had also appointed Mr. C. A. Loxton, B.V.Sc., Chief Inspector of Stock, to the Board.

THE WORK IN HAND.

Under the guidance of the Manager of the orchard (Mr. C. G. Savage) the party then set out on a tour of inspection, first visiting Block A., consisting of 10 acres of trees planted in 1911. Amongst the tests being conducted on this block were pruning trials with different varieties of peaches, cincturing and root pruning tests with orange trees, and manurial tests with varieties of fertilisers applied to orange, peach, and apricot trees. In Block B, comprising 11½ acres, there were variety tests of nectarines, and 5 acres devoted to Smyrna figs planted in 1923, 3 acres under preparation for almonds oranges, and variety tests with almonds. Block C carried 2½ acres of Smyrna figs planted in 1923, 3 acres under preparation for almonds with the object of testing the value of this tree as a commercial proposition when planted in solid blocks, and a collection of home garden fruits. Block D was occupied principally by vines of the Muscat Gordo Blanco, Zante currant, and sultana types pruned and trained to a number of different systems for comparative purposes. Block E was occupied by Washington navel oranges undergoing fertiliser trials, and Smyrna and white Adriatic figs being tested commercially. An area of 2½ acres was under test to various citrus stocks. Block F contained date palms, fertiliser trials with Muscat Gordo Blanco vines, and pears for drying purposes. Block G was planted to sultana and currant vines which are being dressed with different fertilisers for comparative purposes, and prune and apple varieties. Block H is under lucerne to provide feed for the orchard horses. The 14 acres comprising Block I have been planted to walnuts, heavy bearing vines one-quarter acre devoted to a variety vineyard, and one-third acre to sultana vines planted for the purpose of providing vines on which to initiate tests to try out problems in pruning and training which might crop up from time to time. Ohanez export grape, trained on 7 ft. trellises, occupies five-eighths acre, and cincturing tests with currant and sultana vines one-quarter acre. Prune stock tests, and Gordo, sultana, Doradillo, and currant vines being treated with varying quantities of fertilisers, occupied the balance of this block, the boundary of which has been planted with a windbreak of olives. The spread of a salt patch which appeared early in the history of the orchard has been effectively controlled by the installation of a system of underground drainage. At the time of the visit one series of drains was in operation, and another was being laid down.

SECOND REPORT OF THE DAIRY HERD OF AYRSHIRE COWS AT THE KYBYBOLITE EXPERIMENTAL FARM.

October 1st, 1922, to September 30th, 1923.

[By L. J. Cook, Manager].

A few years ago some good types of pedigree Ayrshire and grade Ayrshire cattle were purchased from various noted herds in Victoria for the Kybybolite Farm as the nucleus of a herd to test the possibilities of the district for dairying. The natural climatic conditions led to the choice of this hardy Scotch breed of milking cows, and they have so far undoubtedly proved that they can withstand the comparatively cold and wet winter conditions very well, and their natural habit as good foragers enables them to secure the most from the gradually improving pastures of Kybybolite.

It is proposed in this report to deal solely with results obtained from young cows, bred and reared on the farm, and which therefore have known no other conditions than those existant at Kybybolite. We now have a fairly complete dairy plant equipment, including milking machines, feeding and housing shed, one 90-ton silo, and a dairy for handling milk, cream, &c., sufficient for us to give the herd reasonable treatment, and careful records of milk supply, tests, and feeding have been kept continuously for the past two years.

Table I. shows the monthly production for all cows during the last 12 months in the herd that were bred and reared at the farm.

TABLE I.—*Statement showing Total Production by Ayrshire Cows (bred and reared at Kybybolite Experimental Farm) for 12 Months ending September 30th, 1923.*

Month.	Average Cows under Test.	Average Cows in Milk.	Average fat Butter-Test.	Milk.		Butterfat.	
				Produced by Herd.	Per Cow.	Produced by Herd.	Per Cow.
1922-23.	Cows.	Cows.	%	Lbs.	Lbs.	Lbs.	Lbs.
October	14-00	10-50	4-62	7,070	505	328-45	23-32
November	14-36	10-36	3-96	7,969	554-98	315-35	21-96
December	15-00	12-00	3-87	9,315	621	360-66	24-04
January	16-10	14-00	4-10	10,526	653-79	431-63	26-81
February	18-00	16-70	3-90	9,912	550-66	386-88	21-49
March	18-00	16-00	3-93	8,709	483-83	342-39	19-02
April	18-73	14-63	4-14	6,023	321-57	249-58	13-33
May	19-52	13-23	3-97	6,120	313-52	242-92	12-44
June	20-00	15-40	3-96	8,218	410-90	325-33	16-27
July	21-00	16-80	4-05	9,946	473-62	402-93	19-19
August	22-84	19-39	3-92	11,105	486-21	435-14	19-05
September	24-47	19-67	3-71	13,671	558-68	506-53	20-70
Means	18-50	14-89	3-98	—	5,933-76	—	237-62
Total production for year				108,584	—	4,325-79	—
Average daily production				297-5	16-26	11-85	0-65

It must be noted that this result has been practically obtained from cows on their first and second lactation periods. During the 12 months five cows completed their first lactation period, eight cows completed their second, one cow completed her third, whilst 11 other heifers have started their first period. The very low average returns for April and May were undoubtedly due to the unusually dry autumn, and as several cows were nearing the close of their lactation periods it was impossible to keep them up to their milk. The continued wet following throughout the winter months and the consequent poor growth of feed and crops, deprived the herd of early green feed, and caused the average returns for June, July, August, and September to be lower than they should be in ordinary seasons. It is to be noted that the poor weather conditions have reduced the percentage of butterfat, more so than the supply of milk. Judging on the season and the age of the cows the general average return for the year of 593galls. of milk and 238lbs. butterfat per cow can be looked upon as satisfactory.

The disposal of our dairy products at present is perforce confined to the sale of cream for butter making and the utilising of skim milk in pig raising. For the 12 months under review the prices received for butter have been good, and the actual average price received at the farm for each month is as follows:—

1922—

October	1s. 1.42d. per lb.
November	1s. 0.58d. “
December	1s. 0.77d. “

1923—

January	1s. 3.43d. “
February	1s. 4.98d. “
March	1s. 7.69d. “
April	1s. 10.08d. “
May	1s. 10.14d. “
June	1s. 6.85d. “
July	1s. 5.25d. “
August	1s. 1.25d. “
September	1s. 2.56d. “

Mean 1s. 4.58d. per lb.

Allowing for 15 per cent. overrun we find that we received 4,974lbs commercial butter from the cows in the herd. This at 1s. 4.58d. per lb equals £343 12s. 5d. Add the value of skim milk, 10,425galls., which at 2d. equals £86 17s. 6d, makes a total value of £430 9s. 11d. received from the 18.5 cows (average number in herd for the 12 months), or a return in cash of £23 5s. 5d. per cow.

FEED.

A careful record of feed given to cattle on the farm has been kept, and the average quantities fed to each milch cow, together with fair estimated market values are shown in the next table.

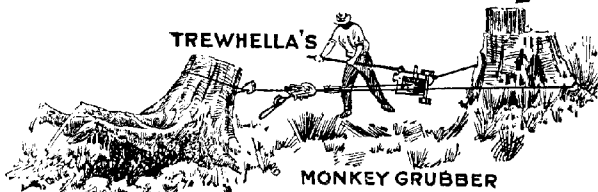
TABLE II.—Average Feed Consumed per Milk Cow at Kybybolite Experimental Farm for 12 Months ending September 30th, 1923.

Quantity.	Variety.	Price.	Value.
14 cwt. 3½ qrs.	Hay chaff	@ £4 per ton	£ s. d. 2 19 6
1 ton 16 cwt.	Ensilage	@ £1 per ton	1 16 0
11 bush.	Bran	@ 2s. 2d. per bushel	1 3 10
33 bush.	Oats (crushed)	@ 3s. per bushel	5 0 6
44 cwt.	Greenfeed	@ 10s. per ton	0 2 2
4 acres	Pasture	@ 4s. per acre rent	0 16 0
Total value of feed per cow			£11 18 0

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H. N. WICKS, Balhannah

During the year the herd was necessarily a good deal hand fed to supply concentrates and make good the shortage on the pastures, and the foods used were almost wholly produced on the farm. The little bran was the only purchased feed, and this was given during the latter months of 1922 when our supply of oats was running short. Crushed oats were fed as concentrates to all milkers during the rest of the period, the quantity fed varying with the quantities of milk produced by the cows individually.

With reference to bulk feed, our supply of ensilage was short; hay chaff was mixed with the ensilage throughout the autumn and winter months. Very fair grazing was available for the cows during the spring and summer months, but through the lack of early rains and the extremely wet winter no bulk of green feed has been available this year until September.

Approximately the milking herd obtained half its bulk feed from growing pastures during the year. Calculating that ordinary pasture of the district carries at the rate of three-quarters of a sheep, or 75lbs. live weight of stock per acre, and allowing 600lbs. as the average live weight of young cows, I have therefore allowed an estimated acreage of four per cow for pasture, and hence have charged the nominal rate of 4s. per acre as rent against each cow.

During the winter, from May 1st to September 30th, all milk cows were housed over night.

It is not proposed in this report to go into the full details of balancing accounts for this herd, but the balance left, £11 7s. 5d., after subtracting cost of feed from value of produce received, should be made to cover the cost of labor and upkeep with the aid of up-to-date machinery, and return a fair percentage of interest on capital outlay.

The following table shows the average returns from the dairy herd for the past two seasons:—

TABLE III.—Average Returns from Ayrshire Dairy Herd, Kybybolit, 1921-23.

Year.	No. of Cows.	Milk Yield per Cow.	Average Test.	Butter fat Yield per Cow.	Price per Lb.	Gross Return per Cow.	Value of Feed per Cow.	Net Return per Cow.
		lbs.	%	lbs.	s. d.	£ s. d.	£ s. d.	£ s. d.
1921-22	10-15	5,715	4.36	245	1 1.3	19 13 7	9 11 0	10 2 7
1922-23	18-50	5,934	3.98	238	1 4.58	23 5 5	11 18 0	11 7 5
Means .	14.32	5,824	4.17	241	1 2.94	21 9 6	10 14 6	10 15 0

Following is a list of individual records of the cows, in order of merit, that have completed lactation periods during the past two years.

TABLE IV.—*Showing Returns from Individual Cows that Completed Lactation Periods of 273 days between October 1st, 1921, and September 30th, 1923.*

Date of Completion of Test.	Name.	Age at Start of Period.		Milk.			Butter Fat.	
				Last Day of Test.	Means per Day.	Total.	Mean per cent.	Total.
Cows on First Lactation Period.								
		Y.	M.	Lbs.	Lbs.	Lbs.		Lbs.
Feb. 28, 1923	Rose of Kybybolite	2	6	19	24.92	6,804	4.07	277.19
July 13, 1922	Countess of Kybybolite	2	4	13	22.20	6,060	4.59	278.23
Jan. 7, 1923	Joan	3	1	10	20.80	5,678	4.52	256.61
Jan. 30, 1923	Betty of Kybybolite	2	8	5	20.94	5,717	4.21	240.69
Jan. 14, 1922	Pansy	2	2	6½	19.94	5,444	4.24	230.70
Jan. 11, 1922	Ruby of Kybybolite	1	11	6½	19.05	5,201	4.33	225.42
Aug. 19, 1923	Laurel	2	8	12	21.03	5,741	3.63	208.33
Jan. 30, 1922	Blanche of Kybybolite	2	6	8	18.04	4,925	4.28	210.89
Aug. 27, 1922	Lola	2	2	12	16.88	4,607	4.29	197.78
Jan. 30, 1922	Maggie of Kybybolite	1	8	11	17.95	4,900	3.99	195.63
May 27, 1922	Lily	2	6	2½	14.73	4,022	4.34	174.56
April 15, 1923	Lilac of Kybybolite (256 days)	2	2	—	12.17	3,322	4.61	153.25
Oct. 1, 1922	Lady of Kybybolite	3	3	2	14.73	4,020	3.81	153.21
Means					18.72	5,111	4.22	215.57
Cows on Second Lactation Period.								
June 30, 1923	Countess of Kybybolite (259 days)	3	4	—	25.55	6,975	4.49	313.29
April 12, 1923	Blanche of Kybybolite	3	7	11	26.07	7,116	4.26	302.95
Jan. 7, 1923	Ruby of Kybybolite	2	11	6	22.44	6,126	4.20	257.12
Aug. 16, 1923	Lola	3	2	2	22.13	6,041	3.97	239.81
Feb. 22, 1923	Pansy	3	2	1	19.82	5,410	3.86	208.95
April 21, 1923	Lily (242 days)	3	6	—	19.01	5,190	3.81	197.80
July 31, 1923	Maggie of Kybybolite (252 days)	3	0	—	18.70	5,106	3.77	192.27
Dec. 31, 1921	Duchess of Kybybolite	3	3	—	15.29	4,175	4.88	203.68
June 10, 1923	Lady of Kybybolite (158 days)	4	3	—	11.90	3,249	3.80	123.55
Means					20.1	5,487	4.12	226.6

From the above tables it is noticeable that the returns of Countess, Rose, and Blanche are highly satisfactory. Lady has failed in two periods and consequently she has been fattened. It is of interest to note that all the cows in the above list, with the exception of Laurel, have been sired by the one bull, "Anthony of Gleneira," the foundation sire of our herd, who came from the Gleneira Stud. of Flinders, Victoria.

By referring to the "Standard Herd Test," part 9, volume XIX, of the *Victorian Journal of Agriculture* evidence will be seen that some of Anthony's heifers, sired before he came to us, are holding their own amongst the Ayrshires of Victoria.

We have been fortunate in being able to purchase a bull calf from one of the best cows of the Gowrie Park Stud, Victoria, and hope with the aid of this one, and "Loyalty of Bridge View" (son of the champion cow of Mr. R. J. Clements) to improve materially our herd in the future.

I wish to again congratulate the farm stockman, Mr. A. R. Rowe, who continues to handle the herd carefully and well.

WHEAT CROP COMPETITION AT PETINA

A Wheat Crop Competition was arranged by the Petina Branch of the Agricultural Bureau during the season just closed. Mr. R. Hill (Manager of the Government Experimental Farm, Minnipa) acted as judge. The crops exhibited were placed by Mr. Hill in the following order:—

Table Detailing Competing Crops in Order of Merit, and Points Awarded.

Competitor's Name in Order of Merit	Position.	Present Crop Sown in.	Date of Seeding.	Amount of Manure (super.)	Amount of seed.	Variety.	Appearance Yield.	Trueness to Type.	Freedom from Disease.	Freedom from Weeds.	Evenness of Crop.	Points
							80 %	10 %	10 %	15 %	5 %	100 %
A. Johnson ..	1	Fallow ...	Late in April	45lbs. 45 %	1bs. 45	Late Gluyas	50	7	9	12	4	82
C. Campbell ..	2	September Fallow ...	19/5/23	56lbs. 45 %	50	Federation	45	8	9	13	4	73
G. P. Roberts	3	Ploughed in March	31/5/23 ...	50lbs. 36 %	60	Late Gluyas	40	10	10	14	4	78
G. Campbell .	4	October ... Fallow ...	1/6/23	45lbs. 45 %	60	Late Gluyas	40	9	9	14	4	78
H. H. Howard	5	September Fallow ...	3/6/23	70lbs. 45 %	60	Late Gluyas	40	9	6	10	4	63
J. Bascombe .	6	Fallow ...	Late in April	50lbs. 36 %	50	Late Gluyas	30	10	9	13	2	84

On the individual crops, Mr. Hill made the following comments:—

THE COMPETING CROPS.

1. *Mr. A. Johnson.*—Portion of this crop was sown on plain land, and the remainder on scrub land. A very fine crop with splendid head development; very strong culm for this variety, and good stooling, especially on the scrub land portion. Germination generally good, but better on the scrub land than on the plain. This crop was awarded highest points for apparent yield, but had heads of other varieties through it for which it lost points. There was a trace of smut in it; also a few weeds. Points were also lost on account of the unevenness of crop, some being on scrub, and some on plain land. The success of this crop was attributed to the fact that it was sown early more than anything else.

2. *Mr. C. Campbell.*—Grown on plain land. Exceptionally fine growth for Federation, with a fine head development. Germination was rather irregular, and stooling patchy but generally good. Fairly free from weeds, and there was a trace of smut through it.

3. *Mr. G. P. Roberts.*—This crop was sown on land ploughed up in March, and was a fine, even crop, gaining full points for trueness to type and freedom from disease. It was very free from weeds, but was rather late for this variety, and consequently lost points. Considering that it was seeded at the rate of 60lbs. of seed per acre, the germination was not what might have been expected. Stooling was fair, and it was an exceptionally good crop considering that it was on grass land. A heavier dressing of superphosphate would have probably made a remarkable difference to it.

4. *Mr. G. Campbell.*—Sown on plain land fallowed in October. This crop was exceptionally green for this variety at this time of the year, and with a dry spell would probably pinch, hence it lost points for apparent yield. It was very free from weeds, and also disease, but had a trace of smut in it. A very even crop, but rather poor stooling. Considering that the seeding was at the rate of 60lbs. per acre, the germination was not good. The heads in this crop were short, showing a number of barren spikelets at the base.

5. *Mr. H. H. Howard.*—Sown on September fallow, and rather a disappointing crop considering that the super dressing was 70lbs. of 45 per cent., and the seeding was at the rate of 60lbs. per acre. Points lost on apparent yield on account of heads not being very well developed; only a fair germination. The stooling was fair, but smut was in evidence. This crop also had small patches of take all in it, and in one case a splendid illustration of how oats will resist this was seen. In a patch of take-all a very well stooled oat plant was thriving where the wheat had been wiped out. There were weeds in this crop, for which it also lost points.

6. *Mr. J. Bascombe.*—This crop certainly suffered from strong winds, and would no doubt have shown up much better had it had a more liberal dressing of superphosphate. It was uneven, the low-lying portions carrying a well stooled crop, but the remainder had poorly stooled, spindly growth. On one end of the field the crop had suffered badly from the winds and drift. Germination only fair; very free from disease, only an odd head of smut being noticed. Full points for trueness to type were awarded. This competitor has splendid evidence in the same field of what heavier dressings of superphosphate will do in a strip where he had been liberal with this fertilizer.

COMMENTS AND SUGGESTIONS.

Prior to presenting his report at a meeting of the Branch, Mr. Hill expressed his pleasure at the enthusiasm and general good spirit shown by all members of this Branch in connection with the competitions. He then proceeded to make suggestions which he thought might prove of interest.

FALLOWING.

For the general improvement of crops, he said, more attention should be paid to early fallow. The land should be broken up as soon after seeding as possible. It should not be ploughed too deeply, and not over-worked. A loose surface worked to about the depth at which the seed was to be sown was all that was necessary once the land had been fallowed up. From then onward, the object should be to keep the soil below that loose surface well compacted. The land should be cultivated only when it was necessary to rid it of weeds or to break the surface after a rain. The practice sometimes followed of allowing the weeds to seed, and then attempting to destroy them by cultivation, was deprecated. He advised destroying weeds whilst they were still young, thus obviating the need of deep cultivation. Not only did that lessen the danger of the seed bed being broken up, but it also made it possible, very frequently, to effect the work with the harrows. In such cases in which it seemed inevitable that the land would carry a crop of weeds he advised seeding an extra 10lbs. or 15lbs. of grain per acre, and thus endeavouring to crowd out the weeds.

MANURIAL DRESSING.

Heavier dressings of superphosphate than were general in the district could certainly be applied with advantage. Especially was that so on those farms on which sheep were carried. The result would be a considerable increase in the stock-carrying capacity of the grass land. Dressings of 112lbs. of 36 per cent., or 90lbs. of 45 per cent. superphosphate were advised, especially where crops were being sown on "old" land.

VARIETIES.

He suggested that crops for competition should consist of as few varieties as possible. He advised the use of clean seed true to type.

DISEASES.

The crops examined revealed the presence of Stinking Smut (*Tilletia tritici*) in the district, and recent tests showed that 1 per cent. solution of formalin proved the most effective treatment. Flag Smut (*Urocystis tritici*) was also noticed in some plots. Whilst none of the plots submitted for competition was more than lightly infected, he had noticed one crop in the district which was damaged to the extent of about 30 per cent. of the yield which might otherwise be expected. The treatment which he recommended where the disease was prevalent was to burn off the stubble, fallow the land, and keep it free of all rubbish. It should then be sown to oats or a variety of wheat different from that which had previously been grown on the land. Constant cropping with wheat tended to encourage the disease and Gluvas was a variety that was more subject to it than some other wheats. It was inadvisable to sow until after the first autumn rains in order to allow the spores to germinate before seeding was commenced.

"SUNTYNE" COMBINED DRILL AND CULTIVATOR CROP GROWING COMPETITION, 1923.

[By W. J. SPAFFORD, Superintendent of Experimental Work.]

Between November 20th to 23rd, 1923, Mr. F. Coleman, "Tueta," Saddleworth, and the writer judged the wheat crops entered in the competition for the best 100 acres of wheat sown by a "Suntynne" Combined Drill and Cultivator, such crops to be limited to those grown in the district of Yorke Peninsula, including Kadina, Wallaroo, and Port Wakefield.

This was the third year of the competition, which was for a trophy valued at £50, to be won twice before becoming the property of the competitor. One entry only was allowed to each farmer, and that was to consist of 100 acres of wheat, composed of not more than three varieties.

The crops were judged to the arranged scale of points of:—

	Per Cent.
Apparent yield	65
Trueness to type and purity	5
Freedom from disease	10
Evenness, condition, appearance, and freedom from defects	5
Freedom from weeds	15

This year the crops submitted to the judges were allotted the points set out in the following table:—

DETAILS OF CROPS.

Competitor's Name.	Address.	Position.	Total No. of Crops Grown on Field.	Present Crop Sown on—	Date of Seeding.	Amount of Seed.	Dressing of Super.
Donald, S.	Urania	1	20	Fallow	15/6/23	Lbs. 85	Lbs. 90 (45%)
Enrich, C. F. G.	Kilkerran	2	17	Fallow	27/6/23	75	80 (45%)
Farley & Sons, A.	Maitland	3	17	Fallow (pt.)	10/6/23	70	100 (36%)
Gott, G. L.	Maitland	4	15	Grass land (pt.)	15/6/23	75	112 (45%)
He, H. O.	Sth. Kilkerran	5	15	Fallow	18/6/23	75	120 (36%)
He, H. O.	Sth. Kilkerran	5	15	Fallow	10/6/23	80	112 (36%)
Hy & Son, Jos.	Urania	6	20	Fallow	7/6/23	100	90 (45%)
Inslade, G. L.	Maitland	7	30	Fallow	15/6/23	75	75 (36%)
Jones, S. J.	Curramulka	8	7	Fallow	16/6/23	60	112
Koch, O. D.	Tiparra	9	20	Fallow	17/5/23	65	80 (45%)
Ling, W. G.	Sth. Kilkerran	10	15	Fallow	17/5/23	60	90 (36%)
Mer, E. & J.	Maitland	10	20	Fallow	1/6/23	70	80 (45%)
Isworth, E. L.	Curramulka	10	16	Fallow	24/3/23	80	105 (45%)
Naby, C. W.	Price	13	15	Fallow	4/6/23	60	90 (45%)
Pat, G. H.	Edithburgh	14	17	Fallow	22/5/23	60	112 (45%)
Robt, A. R.	Urania	15	15	Fallow	4/5/23	70	100 (45%)

DETAILS OF JUDGING.—POINTS AWARDED.

Competitors' Name.	Variety.	Apparent Yield.	Trueness to Type and Purity.	Freedom from Disease.	Evenness, Condition, Appearance, and Freedom from Defects.	Freedom from Weeds.	Total.
Greenslade, S.	Major	65%	5%	10%	5%	15%	100%
	Field Marshal	55.5	4.5	8.5	4.5	14	87
Heinrich, C. F. G. ..	Ford	53.5	3.5	9.5	4.5	14	85
McCauley & Sons, A. .	Ford	48	4.5	9.5	4	13.5	79.5
	Late Gluyas	44.5	5	9.5	4.5	14.5	78
Tippett, G. L.	Currawa	46	4	9	4	13.5	76.5
Linke, H. O.	Queen Fan	43	4.5	8.5	4	12.5	72.5
Kelly & Son, Jos.	Late Gluyas	42	4	8	4	12	70
	Ford	38.5	4.5	8	4.5	14	69.5
Greenslade, G. L.	Nugget	41	4	8	3	12.5	68.5
	Ford	39.5	4	9	3.5	11.5	67.5
Watters, S. J.	Federation	39	4	8.5	3.5	12.5	67
	Big 8	39	3.5	8	3.5	13.5	67.5
Jericho, O. D.	Late Gluyas	36	3.5	8	4	13	64.5
	Dart's Improved	30	4	8	3.5	11	56.5
Hasting, W. G.	Currawa	30	4	8	3	10.5	55.5
Honner, E. & J.	German Wonder						
	Nugget						
Goldsworthy, E. L. .	Federation						
	Currawa						
Ormsby, C. W.	Currawa						
	Late Gluyas						
Hart, G. H.	Ford						
	Big 8						
	Nugget						
Gersch, A. R.	German Wonder ..						

THE COMPETING CROPS.

1. *Mr. S. Greenslade, Urania* (Major and Field Marshal).—The crops submitted by Mr. S. Greenslade were again good, and at the time of inspection promised to give fairly high grain yields. Both varieties were fairly true to type, but the Major showed more admixture, by the presence of a few plants carrying bearded heads. The Major contained some "flag smut," and towards the east end of the block a number of very small patches of "take-all," whilst the Field Marshal showed just a little "bunt." Both crops were nice and even, except that the small late heads of Major were "white tipped," and the Field Marshal showed some wind damage. Hardly a weed was to be found in the Field Marshal, whereas, although the Major was not dirty, still it contained some barley, catchfly, charlock, drake, a sprinkling of wild oats, and a few turnip plants. A crop showing every evidence of good farming practices.

2. *Mr. C. F. G. Heinrich, Kilkerran* (Ford).—This crop of Ford contained a noticeable amount of club-headed and brown-chaffed wheats as admixture; was comparatively free from diseases, only showing "flag smut"; was nice and even; and was really clean, only showing a little charlock, poppy, and wild oats. On the whole, it was a beautiful crop and very regular, and a great credit to the grower.

3. *Messrs. A. McCauley & Sons, Maitland* (Ford and Late Gluyas).—The outstanding feature of this crop was the general excellence of the Late Gluyas grown on "grass" land, which was much above what would be expected. Both varieties were fairly true to type, but some

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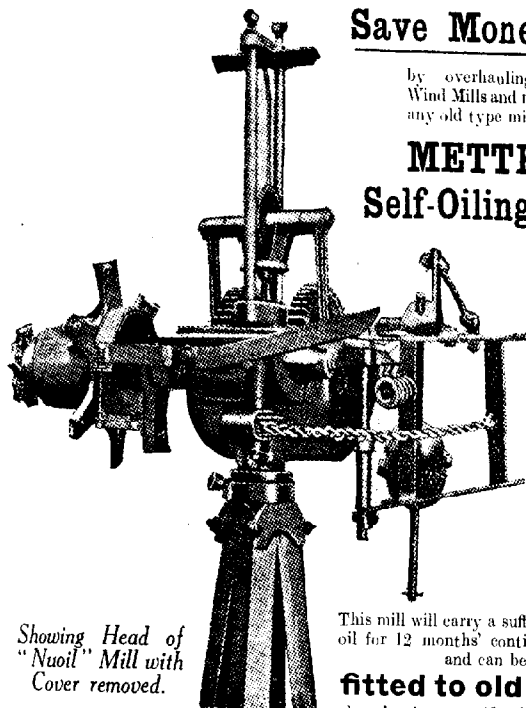
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bearded wheat was in evidence in the Ford. Not much disease was noticeable, except "take-all" and "flag smut" in the Late Gluyas. The evenness of both crops was affected by the presence of weak patches where an excess of water had obtained, and the Ford suffered a little from wind damage. Both crops showed burr clover, sheep weed, poppy, charlock, a little wild oats, and a little soapwort, but on the whole were fairly clean.

4. *Mr. G. L. Tippet, Maitland* (Currawa).—This was a nice, clean, and regular crop, true to type, showing just a little "loose smut," a little "take-all," and a little "flag smut," and a few of the following weeds:—Wild oats (in strips), charlock, sheep weed, soapwort, and barley.

5. *Mr. H. O. Linke, South Kilkerran* (Ford and Queen Fan).—The crop of Ford showed both bearded and brown-chaffed wheats as admixture, but the Queen Fan was fairly true to type. "Take-all" was in evidence in both crops, particularly the Queen Fan, and both varieties showed some "flag smut." The crop was slightly irregular, owing to "take-all" and the presence of comparatively extensive weak patches. Neither block was very dirty, but charlock, cockspur, wild oats, and soapwort were present, and a little barley was in the Queen Fan, and a few patches of the Ford were badly affected with wild oats.

6. *Messrs. Jos. Kelly & Son, Urania* (Late Gluyas, Ford, and Nugget).—In this crop all three kinds had made strong, rank growth, and were still fairly green at the time of judging. All varieties were fairly true to type, but the Ford showed more admixture than the others. Throughout the block "take-all" and "flag smut" were very noticeable, and both diseases had done most damage in the crop of Nugget. Ford showed some wind damage, and the Nugget was irregular, owing to the presence of so many "take-all" patches. The Nugget was cleaner than the others, yet contained more barley, and they all showed drake, cockspur, catchfly, melilot, wild oats, and canary grass.

7. *Mr. G. L. Greenslade, Maitland* (Ford and Federation).—The block of Ford contained, as admixtures, the bearded wheat and the brown-chaffed wheat so common in this crop in this district, and the Federation showed light-chaffed and tall wheats. "Take-all" and "flag smut" were in evidence, and to a greater extent in the Federation than the Ford. The Ford showed some wind damage, and the Federation, although good in places, was rather irregular. The crop was, on the whole, fairly clean, but contained soapwort, poppy, drake, wild oats, and barley.

8. *Mr. S. J. Watters, Curramulka* (Ford, Big 8, and Late Gluyas).—Of these varieties, the Big 8 and Ford were quite good, whereas the Late Gluyas was only fair. All were fairly true to type, and again the Late Gluyas was the worst of the three. Ford showed just a little "flag smut," otherwise was fairly disease-free; Big 8, besides "flag smut," contained "bunt"; Late Gluyas was affected by "take-all" and "flag smut." The Late Gluyas was rather patchy and uneven, but the other two varieties were nice and regular. This crop was fairly clean, yet showed patches containing barley, melilot, burr clover, barley grass, catchfly, and charlock.

9. *Mr. O. D. Jericho, Tiparra* (Dart's Improved and Currawa).—The Currawa was fairly true to type, but Dart's, which constituted the great bulk of the exhibit, showed quite a lot of "rogues." Both crops contained a fair number of small patches of "take-all," and a little "flag smut," but the reduced marks for "Freedom from disease" are due to the fact that the tracks and headlands, which were sown with an early variety, were only partly cut out, and what remained was very badly affected by "bunt." The Currawa was a nice, clean crop except for the barley, but wild oats were bad in parts of the Dart's, and it also contained cocksbur and melilot.

=10. *Mr. W. G. Hastings, South Kilkerran* (Ford and German Wonder). The crop of Ford was really good, being fairly true to type, showing only a little "flag smut" and a little wind damage, but was rather dirty with wild oats, and contained some melilot, soapwort, poppy, canary grass, and charlock; whereas the German Wonder was only fair, containing some "take-all" patches and "flag smut," was really patchy, varying from good to poor, and showed wind damage, and, besides the weeds present in the Ford, contained barley and drake.

=10. *Messrs. E. & J. Honner, Maitland* (Ford and Nugget).—The crop of Ford was much better than the Nugget, only showing a little "take-all" and "flag smut"; was rather patchy, much of it being really good, whilst extremely poor patches were too prevalent, and showed some wind damage; and was a clean crop, showing a few patches of oats, a few poppies, and a little charlock. The Nugget was not a good crop, and showed "take-all," "flag smut," and "loose smut"; was patchy and irregular, and was rather dirty with barley, drake, soapwort, poppy, and charlock.

=10. *Mr. E. L. Goldsworthy, Curramulka* (Federation and Currawa).—Of the Federation and Currawa crops submitted, the former was less true to type than the latter, otherwise there was not a great deal of difference between them. They both showed "take-all" and "flag smut," and the Federation was also affected with "loose smut." The whole block was fairly irregular, and crops were very weak at the water runs, and although wild oats, poppy, charlock, and a little barley were present, on the whole they were fairly clean crops.

13. *Mr. C. W. Ormsby, Price* (Currawa and Late Gluyas).—The Late Gluyas, which only constituted a small part of the exhibit, was a very fair crop, being fairly true to type, only showing a little "take-all," fairly regular, but was light in centre of block, and so heavy in other places that it was lodging, and although showing drake, catchfly, and poppy, was fairly clean. The Currawa was a lighter crop, of which one part was badly mixed with other wheats, and it showed "bunt," "take-all," "flag smut," and "loose smut." It was fairly even, except for the "take-all" patches, and showed barley, drake, burr clover, a little charlock, and a lot of poppies.

14. *Mr. G. H. Hart, Edithburgh* (Ford, Big 8, and Nugget).—Of these varieties, the Ford was the most even crop, but it showed some "take-all" and wind damage, whilst both of the others showed "take-all," and "flag smut," and the Nugget was also affected with "loose smut." Barley, drake, barley grass, wild oats, and charlock were fairly thick, making the crop a rather dirty one.

15. *Mr. A. R. Gersch, Urania* (German Wonder).—This crop contained some brown-chaffed wheat, many patches of "take-all," and a fair amount of "flag smut." Because of "take-all," wind damage, and weak patches, it was rather irregular and uneven, and contained a lot of weeds, of which the following were prevalent:—Barley, charlock, drake, poppy, burr clover, wild oats, catchfly, cockspur, and a little soapwort.

(GENERAL.)

Most of the crops submitted to us were very creditable, and clearly showed that the farmers who left their crops in the competition understand the art of wheat production—this being particularly evident in the cases of Messrs. Greenslade, C. F. G. Heinrich, and A. McCauley & Son, where all crops seen on their respective farms displayed great care and correct crop-growing methods.

The outstanding weakness of the crops generally was the losses being produced by the ravages of "take-all," and that this can be avoided is evidenced by the fact that the crops of some farmers were practically free from the disease; and this was particularly noticeable on the farm of Mr. C. F. G. Heinrich, who has entered crops in this competition for three successive years, and although the soils of his farm are of a type more liable to this disease than are many others of the district, "take-all" was not doing damage to the wheat crops in any one of the three years.

NOTES FROM BLACKWOOD EXPERIMENT ORCHARD FOR JANUARY.

[By R. FOWLER, Manager.]

The weather during the month has been consistently cool, the temperature only registering over 100 in the shade on one occasion. The rainfall has been about equal to that of January, 1923; rain falling on eight days. The heaviest fall was 0.46 in. on January 8th. These conditions have favored the apple and pear crops, but have not tended to ripen properly the apricot, peach, and plum crops, most varieties of which are ripening from a week to 10 days later than usual, and do not seem to possess their usual characteristic flavours. Though the weather conditions during the month appeared to warrant a fear that the fungus diseases of trees might develop to a serious extent, such has not been the case, at least, so far as this orchard is concerned.

WOOLLY APHIS.

Woolly aphis is still very much on the increase. As mentioned in previous notes, a comprehensive test with crude salt was started in this experiment orchard this season—applications of salt up to 14 lbs. in weight per tree being used, but up till the present with no beneficial results. Trees so treated are still badly infested with woolly

aphis. So far the salt does not appear to have had any detrimental effect of the tree itself, but it is questionable whether the practice of applying salt to a tree could be long continued without in the end seriously interfering with the life of the tree. This aspect of the test will be watched, and noted later on.

RUSSETING APPLES.

Some fairly definite conclusions may now be drawn from the experiment set out to test whether Burgundy or Bordeaux mixtures cause excessive russetting of apples. It can now be said that under the climatic conditions prevailing in this locality it is not a safe practice to apply either of those sprays after the fruits have formed, though no russetting injury has resulted when applied at the pink stage. Trees sprayed with Burgundy 1-1-10 at this period are now carrying a heavy crop of perfectly clean fruit, but a portion of the same row sprayed again at the calyx stage with 3-4-50 Burgundy plus arsenate of lead for codlin, is carrying a heavy crop, of which almost every fruit is more or less covered with russet. The same results from this aspect are also shown in another test set out for a different purpose. In this instance 12 trees were sprayed with combined sprays, six with Burgundy 3-4-50 plus arsenate of lead, and six with lime-sulphur 1-40 plus arsenate of lead, with the object of testing whether any injury would result to trees or fruit or whether the setting would in any way be affected. Whilst not detrimental to the setting of the crop, it is now clearly shown that from the point of view of russetting the lime sulphur is the better spray to use, as the trees treated with this mixture are carrying a crop of clean fruit, while those treated with Burgundy are showing a lot of russet.

SPRAYING FOR CODLIN.

We have just completed our fourth arsenate spraying for codlin moth. A portion of the trees—about three acres of the orchard—has had bandages applied, which are carefully looked over every seven days. So far the catch of grubs has not been very numerous, but is on the increase. The apple crop at present appears very clean, and varieties so far harvested show a very small percentage of grubby fruit. As the price for apples promises to be fair and the crop is good, it is to be hoped the season will not prove a bad one for this pest, but every care should be taken, and persistent efforts made, to keep it under control. Late varieties could still receive another spraying with advantage, as they are in danger of catching a brood hatched out from grubby apples left about under the trees, it being often almost impossible to clean this fruit up during the busy time of picking and packing.

The cherry slug—the larva of one of the saw flies—has been noted in this orchard in a previous season, but so far this season it has not put in an appearance. However, I understand it is doing some damage in other districts. It should be easy to control if prompt applications of arsenate of lead are made. It can do considerable damage in a short time if not attended to.



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PRUNING THE YOUNG TREE.

An experiment of considerable interest started on the orchard this season is one having for its object the question of determining the best pruning practice when planting a young tree to produce a well-balanced head. Every aspect of the question is being considered, and a great number of data has been recorded, photographs taken, etc. The trees in this test—36 in number—are all growing well, and the various points being tested are now showing interesting developments.

VISITORS.

This is the time of the year when visits to this orchard should prove of great interest to growers, and such visits either collectively as Branches of the Agricultural Bureau, Fruit Growers' Association, combinations of growers, or individually are welcomed by the Department. The apple and pear collections particularly are carrying good to heavy crops of fruit, and the numerous varieties that can be inspected and tested should have an attraction for the enterprising fruit grower. The numerous experimental tests, such as pruning, stock, tillage, manure, bitter pit, spraying, &c., should also interest growers, and need to be seen in the orchard to be properly understood and valued.

HANDLING APPLES.

The principal work ahead will be the picking, and, with the commercial grower, the marketing and exporting of the apple crop. Every care must be taken in picking, grading, and packing if the best results are to be obtained. In spite of the constant repetition of this warning, one frequently sees fruit that has been handled as if it had been flints from the beach. Apples are dropped into cases, cases are dumped down by drivers when loading at stations after, perhaps, every care has been exercised up to that stage, and all these things, of course, have a bad effect on the market value of the fruit. It is impossible, of course, for the grower personally to handle all his fruit, but he should keep a watchful eye on everybody that has to handle it for him, and see that no carelessness is allowed anywhere.

SMYRNA FIGS.

During the month we have been busy with the caprification of the Smyrna crop of figs, but the *Blastophaga* wasps have been much later in putting in an appearance than usual, and the Smyrna figs were much later in developing. This is not a suitable district for growing these figs for drying purposes, for they mature too late in the season, but they make a most excellent preserve either bottled whole or as jam. Being very rich and sugary they are much superior to any other fig for this purpose.

We are having a very bad time with the birds—green parrots, starlings, and wattle birds being very numerous and voracious. Green pears are being attacked, and it would seem that unless supplies of their natural food are soon available that they are going to be the most destructive pest of the season, and serious steps will have to be taken to in some way overcome this.

MAITLAND BRANCH OF THE AGRICULTURAL BUREAU.

SECOND ANNUAL CROP COMPETITION, 1923.

[By W. J. SPAFFORD, Superintendent of Experimental Work.]

The Maitland Branch of the Agricultural Bureau continued the Crop Competitions inaugurated last year, and for 1923 offered prizes for the best 50 acres of wheat submitted by a farmer in the Maitland and surrounding districts. In this competition, the conditions laid down by the Advisory Board of Agriculture, which must be adhered to before the Government will give any monetary assistance, were accepted, and of these conditions the following have to do with the entries:—

Each crop entered must be of an area of not less than 50 acres. Entries need not necessarily be confined to one variety, but the maximum number of varieties permitted in one entry is three. Each entry should be in one block, or, at all events, in one field; but an exhibitor may submit the whole of a field less than 50 acres in extent, together with a sufficient area in another field to make up the required 50 acres.

Wheat crops entered for competition are to be judged on the following scale of points:—

Apparent yield	60
Trueness to type	10
Freedom from disease	10
Freedom from weeds	15
Evenness of crop	5

Total 100

The crops submitted this year were only eight in number, and have been allotted points as follows:—

Name.	Address.	Variety.	Apparent Yield. 60	Trueness to Type. 10	Freedom from Disease. 10	Freedom from Weeds. 15	Evenness of Crop. 5
S. Greenslade ..	Urania ..	Major ..	51	9	8.5	14	4.5
G. L. Tippet ..	Maitland ..	Currawa ..	45	9.5	9.5	14.5	5
E. F. Maloney ..	Maitland ..	Ford ..	47	8	9	14	4.5
H. O. Linke ..	S. Kilkerran ..	Ford ..	44	8	9	13.5	4
P. J. Bowey ..	Maitland ..	Crossbred ..	53	44	9	13.5	4
Ray Kelly ..	Urania ..	Ford ..	40	9	9	13	4
E. Arrowsmith ..	Maitland ..	Onas	39	8.5	9	12.5	3.5
		Nugget					
		Major					
G. F. Pearce ..	Maitland ..	Major	27	8.5	9	13	3
		Federation					

THE COMPETING CROPS.

1. *Mr. S. Greenslade* (Major).—This very good crop of Major wheat promised at the time of the inspection to produce a heavy-yielding grain crop, although it was then rather on the green side. Some plants with bearded heads were present as an admixture, and some "flag smut," as well as a number of very small patches of "take-all," were in evidence. Although the crop was fairly clean, it contained some plants of barley, catchfly, charlock, drake, turnip, and a sprinkling of wild oats. Other than the appearance of "white tip" on the small, late heads, this was a regular, even crop, and in every way was a great credit to Mr. Greenslade.

2. *Mr. G. L. Tippet* (Currawa).—This crop was true to type, with practically no admixture of other varieties, and showed just a little "flag smut," "loose smut," and "take-all." Very few weeds were present, but wild oats (in strips), charlock, sheep weed, soapwort, and barley were noticeable, and the crop was very regular and level. On the whole, an extremely good "competition" crop, but did not promise to yield as much grain as did Mr. Greenslade's crop of Major.

3. *Mr. E. F. Maloney* (Ford).—Although fairly true to type, some bearded wheat and some brown-chaffed wheat were scattered through the crop. A little "flag smut" and a little "take-all" were the only noticeable diseases affecting the crop, and although fairly clean, a little cockspur, wild oats, poppy, and burr clover were in evidence. Other than misses by the drill, this was a nice regular crop of wheat.

4. *Mr. H. O. Linke* (Ford).—Both bearded and brown-chaffed wheats were present as admixtures in this crop, and "flag smut" and "take-all" were taking their toll. On the whole, the crop was fairly clean, but patches were badly affected with wild oats, and charlock, cockspur, and soapwort were also present. The crop was a bit irregular, owing to "take-all," and comparatively extensive weak patches.

5. *Mr. P. J. Bowey* (Crossbred 53).—This crop was badly mixed with a smooth-chaffed wheat, but showed only a little "take-all" and a little "flag smut." Although it was fairly clean, wild oats, canary grass, poppy, and charlock were present. Both ends of the crop were really good, being tall, thick, and regular, but a strip across the centre was rather weak.

6. *Mr. Ray Kelly* (Ford).—This was a strong, heavy crop, still fairly green at the time of inspection. It showed some other varieties in admixture, and was affected by both "flag smut" and "take-all," and contained drake, cockspur, catchfly, melilot, wild oats, and canary grass. A fairly even crop, but showed some wind damage.

7. *Mr. E. Arrowsmith* (Onas, Nugget, and Major).—These varieties were very green and late, having little more than broken into head at the time of inspection. Although the Major was very nearly true to type, the Onas contained a taller variety, and the Nugget a noticeable amount of a stranger. All varieties were affected by "take-all" and "flag smut," and Major also showed some "loose smut." Quite an appreciable quantity of poppy, catchfly, sheep weed, wild oats, charlock, canary grass, and soapwort were present in all crops, barley in both Nugget and Major, and turnip in the Nugget. Water runs and wet patches made the crop rather irregular.

8. *Mr. G. F. Pearce* (Major and Federation).—Both varieties showed some admixture, and the Major showed "loose smut," as well as "flag smut," which was also present in the Federation. Charlock, poppy, burr clover, wild oats, sand rocket, hog weed, Cape weed, and barley (Federation) made the crops rather dirty. Parts of the crops were good, but others so thin and poor that on the whole it was rather patchy and irregular.

OBSERVATIONS AND RECOMMENDATIONS.

In discussing the crops seen in the Maitland district during the inspection of the Competition Crops in 1922, the opportunity was taken to deal in some detail with the following points:—

1. The presence of "bunt" or "stinking smut."
2. "Take-all" much in evidence.
3. The prevalence of "flag smut."
4. The introduction of bad weeds, such as barley and drake, with the seed.
5. Wheats grown which are badly "mixed" with other varieties.
6. The growing of obviously unsuitable varieties.
7. Too little seed used where the weeds are not killed when fallowing.
8. Insufficient fertiliser.
9. The presence of "eelworms" in the cereal crops.

After touring the district and inspecting many crops in 1923, it is certainly pleasing to note that some of the causes for complaint set out above hardly existed. "Bunt" or "stinking smut" was almost absent this season from all crops examined; practically every crop exhibited in the competition was sowed with sufficient seed and adequately fertilised; and a number of varieties likely to be more suitable than some which are fairly largely grown in the district were being tried.

"Take-all" in the wheat crops was fairly prevalent, but as many crops showed practically no signs of this bad disease, and some of these clean crops were on soils really liable to the trouble, it was quite evident that the disease can be controlled in this district if proper cultural methods are practised. (See *Journal of Agriculture* for January, 1923.)

"Flag-smut" was of common occurrence, but no crops were noticed which were as badly affected as some seen last year.

Some few of the crops seen contained barley and drake, two very bad weeds likely not only to reduce the yield of the wheat crops, but to reduce the price received, and if it is not convenient to purchase seed from crops which are free from seeds of these weeds, all seed used should be "graded" before sowing.

For the production of ordinary "market" wheat, the growing of mixtures of varieties does not matter much, providing that the kinds mixed have about the same maturing period; but better returns are likely to be secured from seed true to type. Crops of "mixed" varieties are usually a sure indication that the farmer does not show sufficient interest in the seed he uses, and if maximum returns are to be secured, only the very best seed available should be utilised.

MANAGEMENT OF DAIRY CATTLE.

[By R. BAKER, Dairy Instructor, Roseworthy Agricultural College.]

The management of dairy cattle can very well be divided into three sections:—(1) The critical stages during the life of the animal; (2) feeding; (3) the question of disease.

It is necessary when dealing with the first section first to take into consideration the calf. The success of the dairying industry depends to no slight extent on the careful rearing of calves. From experience we are led to believe the dairy cow inherits her milk-producing qualities, and it is impossible by any kind of feeding to make an animal produce milk above her milk-making ability. Since this is true it is essential that a farmer should raise the heifer calves from cows possessed of high producing qualities. By care in the choice of a sire, and careful attention to feeding and developing of the heifer calves, he may even hope to increase the flow of milk from an individual.

In order to give a calf a proper start in life it is necessary that the cow should be given proper care before and at the time of parturition. It is a good practice to have a cow dry six to eight weeks before calving. This allows her time to prepare for the labor of parturition and her subsequent lactation period. It is only during the last few months that a growing foetus requires great quantities of nutrients for its development, and a cow should be in sufficient heart for the process of dropping the calf and production of milk. Cows that calve without drying off, especially if they are heavy producers, generally drop weakly nourished offspring, showing the mother did not receive proper care. An excessively fat cow will also frequently drop a weak calf. The theory is that insufficient blood is used for the nourishment of the foetus.

It is necessary that during the last week the cow should be on a light laxative ration. This will not only result in her bowels being in good condition at calving, but will also act as a precautionary measure against milk fever. A pasture is a good place for a cow to calve in. If the climatic conditions are extremely cold she should be placed in some warm secluded spot or a well bedded roomy loose box.

Although it is not necessary for an attendant to be present while the cow is calving, one should be available if the cow needs assistance. If a cow calves normally the mother will immediately begin to lick the new-born calf, which is important as it starts respiration and improves the circulation. Sometimes the foetal membrane covers the

nostrils, and unless removed quickly it may cause suffocation. Occasionally for some reason or other the cow refuses to own her offspring. In such a case the calf should be washed down with warm water and thoroughly dried. The sprinkling of a small quantity of salt on the calf will sometimes induce the mother to lick it. A vigorous calf will attempt to rise about 15 minutes after birth.

The dairy heifer is almost always reared by hand, because of the value of milk for human consumption. There is some difference of opinion as to how long a calf should remain with the cow. Some believe in taking the calf away immediately after the cow has licked it over, not allowing it to suck; others allow it to have a couple of drinks; while again others allow the calf to remain with the mother until her udder becomes normal and the milk is fit for human consumption. There is very little difference as to the point, but it should be taken into consideration that the earlier a calf is taken from the cow the easier it will be to teach it to drink, also there is less trouble with the cow. If the cow's udder is in good condition when the calf is dropped it will be found more satisfactory to take the calf away early. On the other hand, if the udder is hard and caked, it is a good practice to leave the calf with the cow until the condition is removed.

CARE OF NEW BORN CALF.

The first milk a cow gives after calving is called colostrum, which is unfit for human consumption, but this abnormal milk possesses the property of acting both as a laxative and a stimulant to the digestive organs. It is necessary that the calf should receive this milk, not matter what system of feeding is carried out later on. This is the reason why a calf should receive its mother's milk for the first week. If for some reason other milk has to be given, it is advisable to administer small doses of castor oil every two or three hours until the bowels begin to move.

AMOUNT OF MILK TO FEED.

It is necessary to have a calf growing well before any change takes place in its diet. The amount of milk to feed the first week will depend upon the size of the calf. Small calves, such as the Jersey, do not require more than 8lbs. to 10lbs., while larger calves do not require more than 10lbs. to 12lbs. The milk should be given at least three times a day at first, and at a temperature similar to that at which it left the cow's udder. Later on the calves need only be fed twice a day, and as they grow older, the milk may be increased, but should never be fed to a greater extent than 20lbs., even to the largest of calves. Under any system of feeding, it is essential that all utensils used for feeding of calves should be perfectly clean to insure best results.



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SKIM MILK FEEDING.

In localities where cream is sold there is usually a supply of skim milk on hand, and this can economically be fed in place of whole milk. Whole milk is usually fed for the first fortnight or three weeks, according to whether the calf is growing vigorously or not. The change to skim milk should be made gradually, taking about a week. When feeding skim milk, it is necessary to add something to take the place of the fat that has been removed by the separator. There are several substances that can be used to supplement the skim milk, among which are cornmeal, ground oats, and linseed. Cornmeal is an exceptionally good grain for calf feeding, being very rich in fat-forming material, but owing to the difficulty of obtaining it in sufficient quantities at an economical price, it is very seldom used in this State. Both linseed and ground oats are also very useful foods. Three parts of linseed and one of pollard, or three parts cornmeal, three of ground oats, one of linseed, and one of bran make good grain mixtures for feeding with skim milk to young calves. The grain may be either fed dry or in the form of a gruel by mixing with boiling water. The feeding of grain, like all changes in feeding calves, should be done gradually, or else digestive troubles may result. At first, about $\frac{1}{4}$ lb. per calf per day should be given, the amount to be increased as the calf grows older, but it is never necessary to feed more than $2\frac{1}{2}$ lbs. to 3 lbs. up to six months old.

SKIM MILK NOT AVAILABLE.

In cases where no skim milk is available, and where whole milk has a great value for other purposes, calves can be raised by using a minimum amount of whole milk, gradually substituting a grain mixture. The following mixture may be used with good results:—Wheaten flour, 30lbs.; cocoanut meal, 35lbs.; skim milk powder, 20lbs.; linseed meal, 10lbs.; dried blood, 2lbs. 1lb. of the mixture added to 6lbs. of boiling water can be fed when cool in a bucket in the ordinary way. Calves are first given their mother's milk for about a week, then the milk substitute generally replaces the milk until at the end of ten days or two weeks no milk is given. For the first six weeks the young calves receive about 2lbs. of grain per day, and from then on about $2\frac{1}{2}$ lbs. till weaning, which takes place at the end of three months. The calves are then put on a hay and grain ration. Another method is using a minimum amount of milk and substituting rolled oats in the form of a gruel.

The calves should be taught to pick at grain and hay, which they will generally do when they are about three weeks old. Crushed oats

and bran can be kept before the calves in small quantities, and they will soon learn to eat it; also good oaten hay should be available. Lucerne hay is rather too laxative for a very young calf.

FEED AND CARE OF HEIFER AFTER WEANING.

After weaning a dairy heifer, beyond the fact that she should be kept in good growing condition, the management does not present any particular difficulties. If the young animals are on good pasture, no further attention is necessary until ready to come into milk, since a pasture furnishes the best and usually the cheapest growth. If the pastures are deficient in nutriment, it will be advisable to give the heifer small quantities of crushed oats, bran, or linseed meal. When there is no pasture available, the heifer should be supplied with all the hay or good oaten straw she can consume, with a small amount of grain in addition. The object should be to keep the animal in a good, healthy condition, without becoming unnecessarily fat. The liberal use of bulky fodder is desirable, as it is the cheapest, and, further, it is believed by experienced breeders that the consumption of large amounts of bulky foods helps to develop the organs of digestion to the highest, which is necessary when a cow comes into milk. Ensilage, oaten and lucerne hay are well adapted to this purpose. The grain used in feeding the heifer should be such that the animal will put on flesh without becoming fat. Such grains as crushed oats, linseed meal, and bran are suitable.

AGE AT WHICH TO BREED.

The age at which the heifers should come into milk depends upon the maturity of the animal, which is governed to a great extent by the breed and feeding of the animal. Larger breeds such as the Friesians and Shorthorns as a rule should not calve before 30 months. The more rapidly developing Jersey is as a rule sufficiently matured at 24 months. The Ayrshire also takes longer to come to maturity. The heavy feeding of grain results in an animal large for its age, and of early sexual maturity. Some breeders are inclined to have the first calf dropped at a rather early age, claiming in a way to fix a habit of milk production, also securing early financial returns. These animals are allowed to drop their second calf 18 to 20 months later, developing a long milking period. It is questionable whether this method is advisable. Its advocates state that by allowing a longer period between first and second calves, they will have time to grow before the second calf is dropped, but the severe strain of a lactation period does not allow of much energy being devoted to building up the body, unless the heifer is allowed to dry off sometime before calving. Breeding too

young undoubtedly results in small cows, and it is impossible for a young cow to digest a sufficient amount of food to produce milk and growth at the same time. The production of milk in a dairy heifer is the dominant function, and will not be materially checked to allow growth to continue. A cow that calves young usually shows more pronounced feminine characteristics than one that has calved later.

From data supplied by the Agricultural University of America it has been found that the higher milk producers are those that have calved between the ages of 26 to 30 months. It is a great strain on a heifer to develop a foetus, and from investigations it has been found that a heifer does not materially add to her own body during the last three months of pregnancy, even if liberally fed.

DEVELOPMENT OF DAIRY HEIFER.

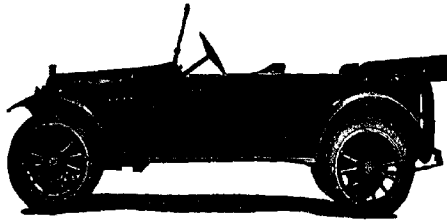
As stated, the important factor necessary for economical milk supply is the individuality of the cow used, and this is mostly dependent on inheritance. Still, the effect of the manner of raising heifers has to be taken into consideration to a very great extent. The poorly developed heifer cannot be expected to make a high producing cow, no matter what her inheritance is.

ALLOWING HEIFERS TO BECOME OVER-FAT WHEN YOUNG.

It has been believed for a long time by many breeders that it is injurious to the milking qualities of a dairy cow for her to become fat when young. This has been thought to develop a tendency towards using feed for body fat which will persist when the animal is in milk and matured.

When a dairy cow lacks dairying qualities, and shows a beef tendency in conformation, it is easy to attribute it to improper feeding when young. It will generally be found that these animals show a distinct tendency to beef when young, but it is not due to improper feeding, but an inherited characteristic. The heavy feeding of a heifer showing distinct dairying tendencies is not injurious to its milk producing functions. Those heifers that have been kept fat from birth until they come into milk lose surplus body fat within a very short time after calving, and show no more tendency to fatten later while in milk than do those fed on a light ration. The marked effect of heavy grain feeding is more rapid growth and earlier maturity. However, the heavy rationing of heifers may prove too expensive, and cannot be practised.

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BULKY RATIONS.

With a great majority of breeders it is considered that the feeding of bulky rations while young influences the digestion of a matured cow. It has been observed that a heifer that has been receiving a heavy grain ration does not eat as much roughage when first put on a typical dairy ration. This difference disappears in time, and later on one is unable to observe the difference in the power of digestion. The digestive system has great power of adapting itself to the character of the food consumed.

HANDLING A HEIFER.

It is a very good plan to handle a heifer before she comes into milk. She should be at times tied up and fed in the cow shed where she is to be milked later on. Thus, getting a heifer accustomed to surroundings will tend to make her quiet, and when brought into milk for the first time she will be of little trouble.

CARE AT CALVING TIME.

The care at calving time should be the same with all animals, whether matured cow or heifer. If she is in good heart, seldom will any complications arise. If the cow is on pasture she should be allowed to remain there, but she should be looked to at least twice a day when about to calve. If she is used to being stalled, it is advisable to turn her in to a good, clean, roomy, loose box, with a good bed of clean straw. Special care should be taken against infection of the navel of the calf and bringing on contagious scours. As the time of parturition approaches, the udder becomes distended and hard, and fills with colostrum. This introduces the question whether a cow should be milked before calving, but if milking is begun it should be continued regularly, but only in extreme cases, when there is evidence of great suffering through the distention of the udder, should a cow be milked before calving. When the tendons and muscles relax on either side of the rump, leaving a hollow appearance on either side of the tail head, parturition may be expected within 24 hours or three or four days at the most.

The cow should be left strictly alone at the time of calving unless some assistance is evidently necessary. As a rule, a calf will be born within half an hour of showing the first signs. If the calf is not expelled after an hour or two, an examination should be made. The normal position of the calf at the time of delivery is fore feet first with the front of the hoofs and knees upwards, while the nose lies between the knees. If the condition of the calf is normal, the cow may be assisted by pulling on the fore feet in an outward and downward direction. This should be done carefully, and when the cow

strains. If the condition is abnormal, the help of an experienced man or veterinary surgeon should be obtained as quickly as possible, for the sooner a job of this description is taken in hand the easier it will be for the operator.

AFTER-BIRTH.

The cow is subject to retention of the after-birth, and special attention should be given to see that this comes away. When a cow is in good condition, the after-birth is usually expelled within a few hours of calving, sometimes immediately. Cows in low condition, and those getting up in years, also unhealthy cows, are more subjected to retention of the after-birth. Giving cold water immediately after calving may cause it to be retained. The after-birth, when expelled, should be removed so as to prevent the cow from following her instinct and eating it, which may result in disorder of the alimentary canal. If the after-birth is not expelled, a serious condition is brought about by the decomposition of the tissues within the body, and the absorption of poisons. The cow loses flesh and produces very little milk. The condition is recognised by the fetid products that escape, and the offensive odours.

The cow should be handled to prevent the retention as much as possible, by giving a drench of Epsom salts before and after calving, or warm bran mash; better still, a mash made of two-thirds bran and one-third crushed oats. The oats act as a stimulating agent. If it does not come away within 24 hours, it should be removed by hand. There are no drugs that can be used for the purpose. If taken in time or when it is not attached to any extent, it may be removed by gently pulling with the hands, or by winding the after-birth around a stick as it comes out. The tying on of weights is not to be recommended, as it often causes breaking off before the whole of it has been removed. Every man having the responsibility of caring for cows should acquire the experience necessary to attend to cases of this nature. The operation should be taken in hand as soon as it is noticed that it is being retained or within 24 hours, as the mouth of the womb may become closed, making it difficult to introduce the hand. The arm of the operator should be lubricated with disinfecting oil as a protection against infection. The tail should be held to one side by an assistant, while the right arm should pass along the right side of the vagina and womb until the operator reaches the first cotyledon to which the membrane remains attached, and remove all attachments, &c.

CARE OF COW AFTER CALVING.

It should be borne in mind that the vitality of a cow is low following parturition, and she should be treated accordingly. The rations for the first few days should be light in character, and not very abundant. Bran mashes, or a mash of two parts bran and one of oats

satisfactorily supply the grain portion. If the udder is hard, the grain should be increased very slowly until the condition disappears. Then more feed can be added, taking as a rule two or three weeks to get her on full ration.

To economically feed a cow, she should be studied as to her individual likes and dislikes (but generally speaking, a cow quickly accustoms herself to almost any kind of good fodder), also to the quantity of milk she is producing. The same ration will not do for, say, one cow giving three gallons of milk per day, and another giving five gallons. The ration should be sufficiently bulky to overcome the craving of a large stomach, and should contain the different nutrients in sufficient quantities without wastage. When studying the question of feeding cattle, there are several factors of importance that must be taken into consideration. In winter weather, warmth and shelter are necessary in the production of milk. If cattle are exposed to cold and rough conditions they must be given more food, or else part of the food that is given under favorable conditions will be used for the maintenance of body heat, leaving very much less for the manufacture of milk. This directs attention to the necessity for some form of shelter for the cows, such as sheds, trees, hedges, &c. A good and economical method of feeding, which will not entail any undue labor or a great deal of knowledge, is to supply the cow with as much bulky food as she will consume, and about 3 lbs. of grain mixture at first. The grain mixture may be made up of bran, crushed oats, linseed meal, or any of the concentrates used in feeding milking stock. Gradually increase the grain by $\frac{1}{2}$ lb. each day, until the cow does not respond to the feeding. Then gradually decrease the concentrates, and very often it will be noticed that the cow is again likely to improve in production. The amount of food given on the day which she begins to fall off in quantity will generally be found to act as a guide as to the amount required by the cow. When cows are on good pasture, the same amount of grain will not be necessary as when cows are being hand fed.

RECORDS.

All dates and records should be carefully kept. Especially reference should be made to dates of service of the bull, for without such a record it is impossible to tell with any accuracy when calving will take place, and in all probability the animal will still be producing milk when she should be having a rest in preparation for next calving.

All good milk-producing cows should have a calf at least once a year. Only in special cases in which yearly records of stud stock are required should the period be extended. Then the cow should not be allowed to go beyond 15 months.

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(Late of State Taxation Dept.)

A. SAIDR, A.F.I.A., Secretary
(Late of Federal Taxation Dept.)

DRYING OFF COWS.

When certain cows are milked continuously, it is sometimes claimed that they cannot be dried up. There is very little difficulty about this if the cows are properly handled. The common method of drying a cow, is to lengthen the interval between milkings by omitting one milking each day. After a few days the milk is only drawn once in two days until secretion is stopped. If a cow is producing as little as 10lbs. of milk per day, milking can be stopped at any time, and no harm will result. If a cow is producing more than this amount, her grain ration should be cut out, and she should be fed only on hay. When dry, she can again be given a cooling ration, the grain being principally bran and crushed oats.

COMMON DISEASES.

Indigestion.—This is generally due to eating unpalatable foods such as mouldy hay, &c., immediately feeding a heavy ration after calving, or drinking extremely cold water. The symptoms noticed are refusal of food, also failure of the cow to chew its cud. The bowels refuse to operate, although in some cases acute diarrhoea may be caused by indigestion. 1lb. to 1½lbs. of Epsom salts with 1oz. to 2ozs. of ground ginger will generally put the cow right. When the cow has recovered sufficiently to eat, appetising foods and bran mashes should be given. Ordinary scour in calves is simply digestive disorder, generally brought about by irregularity in feeding. The best treatment is to reduce the food and give a tablespoonful of castor oil in order to rectify the bowels.

Bloat or Hoven.—This is caused by sudden changes from dry to large quantities of green feed, more especially plants of a leguminous nature. Any condition of food that causes an unusual amount of fermentation, so that the gases formed are created faster than the blood can carry them off, will generally cause bloat. If the case is not extreme, it may be sufficient to drive the animal at a walk for a quarter of an hour. In some cases, placing a tarry or greasy rope in the mouth and tying the ends to the horns is effective. The efforts of the animal to dislodge this object stimulates the secretion of saliva and swallowing, in swallowing the gases escape. In severe and urgent cases the use of the trocar and cannula should be resorted to. The animal should be tapped on the left side, half way between the hip and last rib, with the trocar pointing towards the heart. An ordinary pocket knife may be use if no trocar is on hand. The cannula is more desirable, because it retains the opening, and allows the gases to pass off as they form.

CONGESTION OF THE UDDER.

Congestion of the Udder.—In most cases with heavy milkers, before and just after calving, the udder is enlarged, hot, and tender, with a slight swelling extending along the abdomen. This congested state generally disappears in a day or so, and normal condition can be hastened by allowing the calf to remain with the cow, but at the same time milking her out three or four times a day. If the condition is persistent, massage the udder with camphorated oil, or a mixture of camphor and lard, one to four. This condition may be caused by a chill of the udder, sometimes producing bloody milk. An early treatment, and one that will be found beneficial, is a dose of Epsom salts, followed by a tablespoonful of saltpetre on three successive days.

Teat Trouble.—Sore teats, due to cracks, &c., should be treated with a ointment composed of 8ozs. of lard, 2ozs. vaseline, 2ozs. of camphor, and 2ozs. of boracic acid. In case of hard milkers, the use of teat rings, which will stretch the sphincter muscle at the end of the teat, will tend to make the cow milk easier. If milking tubes are used, great care should be exercised. They should be perfectly clean, to prevent any infection of the udder by their use. A bistoury can also be used for cutting this muscle, and results are sometimes satisfactory. This operation should be conducted under the supervision of a veterinary surgeon.

Cowpox.—This is not generally serious. However, it can be easily spread from one cow to another by the milker, so a cow having cowpox should be milked last. It is present in the form of blisters containing yellowish fluid which gradually dries up, leaving a scaly surface. A good remedy is to wash the udder well with warm water and soap, dry thoroughly, and apply boracic or fine ointment.

Milk Fever.—This is not, strictly speaking, a fever, as the temperature of the animal is lower instead of higher. The disease occurs after calving, and generally in cases of high producing and plethoric animals. It is caused by a disturbance in the circulation of the animal, and often follows easy and bloodless calving.

Sucking Cows.—Some cows develop the habit of sucking themselves or other cows. Devices such as muzzles with sharp nails are rather dangerous, and may cause injury to the udder. A simple method is to place a ring in the nose, with one or two rings attached. They need no attention and do not interfere with the animal's feeding, but interfere with the animal sucking.

DAIRY CATTLE IMPROVEMENT ACT.

A dairyman may purchase a bull for £100, and immediately secure from the Government a free gift of £60 by conforming to conditions laid down in the regulations under the Dairy Cattle Improvement Act, 1921. These regulations, which were approved by the Government in December, 1923, require the Minister of Agriculture to offer to the approved purchaser of any such bull as complies with the conditions set out in the Act, a subsidy of 60 per cent. of the purchase price at the time the animal is purchased, or as soon after as can be arranged, provided that the subsidy shall not exceed £60. This subsidy can be claimed on bulls purchased at auction sales, by private treaty, or at special auction sales arranged by the Government under the provisions of this Act. Arrangements are in progress for a sale to be held at Murray Bridge during March, and full particulars of this are available on application to the Director of Agriculture.

The conditions under which a subsidy can be claimed are as follows:—

1. The bull must have passed a tuberculin test by a Government veterinary officer within six months prior to date of sale.
2. The bull must be in good health, well grown, and true to type.
3. The vendor of any bull shall produce concerning such bull a declaration of health on a form to be supplied by the Department of Agriculture.
4. The bull shall be not less than 10 months old, and not more than five years old.
5. The vendor of any bull two years old and over must produce evidence of fruitfulness in the preceding year.
6. The bull shall be registered in herd books or be eligible for herd book entry.

7. The bull shall be the progeny of officially tested stock reaching the undermentioned butterfat standards during 273 days milking:—

Junior, two years old	200lbs. butterfat
Senior, two years old	225lbs. butterfat
Junior, three years old	250lbs. butterfat
Senior, three years old	275lbs. butterfat
Junior, four years old	300lbs. butterfat
Senior, four years old	325lbs. butterfat
Mature cows	350lbs. butterfat

- (a) If a cow or heifer fails to reach the standard, but subsequently attains it as set for her age, her progeny may, upon the decision of the Advisory Committee for the Improvement of Dairying, thereby be rendered eligible.
- (b) Any cow or heifer reaching the 350lbs. butterfat standard need not be tested for more than one year.

In this regulation a junior animal in each class is one which at date of calving has not attained to $2\frac{1}{2}$, $3\frac{1}{2}$, or $4\frac{1}{2}$ years respectively, and a senior animal is one which at date of calving has attained or is over $2\frac{1}{2}$, $3\frac{1}{2}$, or $4\frac{1}{2}$, but less than 3, 4, or 5 years respectively.

8. The purchaser's application for subsidy shall be made on forms supplied at the sale and indorsed by the auctioneer (if any) and a Government representative.

9. Any bull in respect of which the purchaser has received a subsidy as aforesaid shall, if required, be made available for use to others at a fee not exceeding 10s. per cow. In the case of bulls under two years of age at date of purchase, the owner need not accept more than 15 outside cows during the first year, nor more than 25 cows for bulls two years or over. Failure to comply with this condition owing to an insufficient number of outside cows being available will not invalidate the purchaser's right to the subsidy.

10. The purchaser of a bull shall have the right to refuse the services of such bull for any cows which he may have reason to believe to be suffering from disease, provided that the owner of such cows may appeal to the Director of Agriculture to decide whether any of such cows is suffering from disease.

11. The purchaser shall submit to the Director of Agriculture at the expiration of 12 months after purchase—

- (a) A declaration of health on a form procurable at the Department of Agriculture.
- (b) Signed statements from the owners of all outside cows served and dates of service in accordance with condition 9.

12. The bull shall be kept under conditions satisfactory to the Department of Agriculture.

13. Any purchaser of a bull who receives a subsidy as hereinbefore mentioned, and who commits a breach of any of these regulations, shall be guilty of an offence, and shall be liable to a penalty not exceeding £10.

EXPORT OF FRUIT.

The Horticultural Instructor (Mr. Geo. Quinn) supplies the following information respecting Customs regulations dealing with the export of fruit:—

PACKING.

154. I. Apples or pears intended for export shall be packed in accordance with the following provisions:—

(a) The fruit shall be packed only in cases or trays of the following dimensions:—

CASES FOR APPLES OR PEARS.

Description of Case.	Internal Measurements (Inches).
Australian bushel	18 x 14 $\frac{1}{4}$ x 8 $\frac{2}{3}$
Canadian bushel	20 x 10 x 11 $\frac{1}{2}$
Flat bushel	26 x 14 $\frac{1}{2}$ x 6 (clear of divisions)
Canadian standard	18 x 10 $\frac{1}{2}$ x 11 $\frac{1}{2}$
Three-quarter flat bushel	24 x 11 $\frac{3}{4}$ x 6 (clear of divisions)
Australian half bushel	18 x 8 $\frac{2}{3}$ x 7 $\frac{1}{2}$
Half flat bushel	26 x 7 $\frac{1}{2}$ x 6 (clear of divisions)

TRAYS FOR PEARS.

Internal Measurements (Inches).

18 x 3 $\frac{1}{4}$ x 14 $\frac{1}{2}$, or
 18 x 2 $\frac{3}{4}$ x 14 $\frac{1}{2}$, or
 18 x 2 $\frac{1}{2}$ x 14 $\frac{1}{2}$

Provided that those dimensions may show a variation to the extent of not more than 10 per centum (that is, 5 per centum under or 5 per centum above) on the total cubic capacity of the case.

- (b) The fruit shall be packed in clean, new cases constructed of well seasoned softwood or hardwood that has been smoothly sawn or dressed in an approved manner, and, in the opinion of the collector, sufficiently strong to withstand such handling as is ordinarily incidental to transport to destinations beyond the Commonwealth.

GRADE STANDARDS.

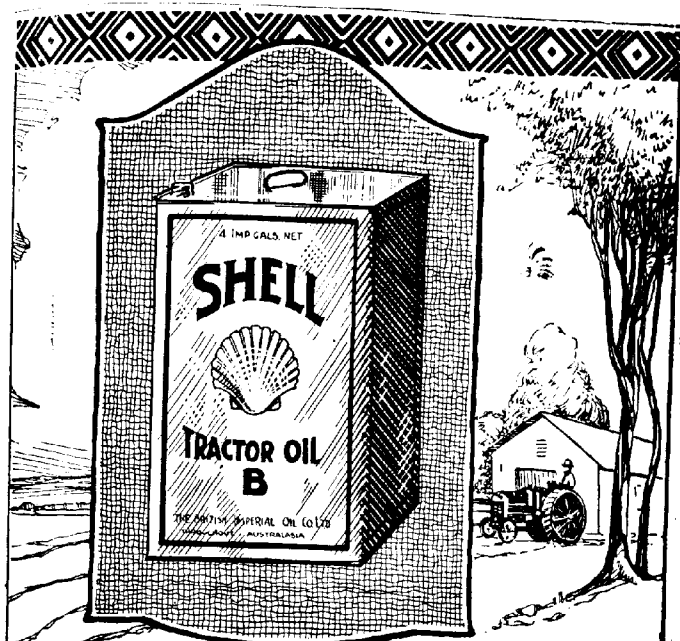
154. 1a. Apples or pears intended for export shall comply with the following conditions:—

- (a) The outer layers or shown surfaces of the apples or pears—whether described as “Special,” “Standard,” or “Plain”—shall be a true indication of the average grade of the contents of the case.
- (b) Apples or pears described as “Special” shall consist of sound, clean, well-formed apples or pears of one size and one variety free from broken skins and from disease. Superficial blemishes caused by hail marks, limb rubs, and sprays shall not be allowed to a greater extent than 5 per centum (by number) of the total fruit in any case. The fruit shall not measure less than $2\frac{1}{4}$ in. in diameter, and shall be of good color for the variety.
- (c) Apples or pears described as “Standard” shall consist of sound, clean, well-formed apples or pears of one size and one variety free from broken skins and from serious blemishes, but fruit slightly blemished by rubbing, black spot, fungus, or caterpillars may be exported, provided that—
 - (i.) The proportion of such fruit does not exceed 10 per centum (by number) of the apples or pears in any case.
 - (ii.) The total area covered by such blemishes on any apple or pear does not exceed the area contained in a circle having a diameter of $\frac{1}{4}$ in.

Russetting of the surface shall not be deemed to be a blemish if the skin is unbroken. The fruit shall be not less than $2\frac{1}{4}$ in. in diameter, except in the case of varieties which, in the opinion of the collector, may be regarded as normally small, in which case the fruit shall be not less than 2 in. in diameter.

- (d) Apples or pears described as “Plain” shall consist of apples or pears of one variety and one size free from broken skins, and not seriously blemished or injured by any disease, but fruit slightly blemished by rubbing, black spot, fungus, or caterpillars may be exported, provided that—
 - (i.) The proportion of such fruit does not exceed 30 per centum (by number) of the apples or pears in any case.
 - (ii.) The total area covered by such blemishes on any apple or pear does not exceed the area contained in a circle having a diameter of $\frac{3}{4}$ in.

Russetting of the surface shall not be deemed to be a blemish if the skin is unbroken. In the case of apples the diameter shall be not less than 2 in.



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RIVER MURRAY HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1923.

Head No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during December.	Per Cow during December.	Per Cow October to December.	Per Herd during December.	Per Cow during December.	Per 100 Lbs. to Decem.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/C	31-03	28-26	26,597-5	857-15	2,502-54	1,011-18	32-59	92-8
1/J	20	15	10,430-5	321-53	1,554-25	456-34	22-82	70-6
1/L	19-55	17-55	12,008-5	594-96	2,150-15	495-38	24-33	96-2
1/M	21-74	15-35	9,046-5	416-12	1,159-97	455-80	20-97	76-7
1/R	18	18	9,579	532-17	1,729-45	429-42	23-86	86-3
1/T	14	8-52	4,873-5	348-11	1,389-21	251-16	17-94	72-2
1/W	17	16-35	8,348	491-06	1,640-99	319-14	18-77	63-1
1/Y	19	16-94	11,107	584-57	1,905-17	495-25	26-06	88-2
1/Z	21	16-87	9,567-5	456-03	1,730-79	405-07	19-29	79-8
1/Co	22-39	20-39	10,783	481-59	1,632-18	474-13	21-18	69-2
1/D	21	20-61	12,367-5	588-93	1,945-03	533-25	25-39	84-2
1/E	11	11	7,672-5	697-50	2,052-65	337-54	30-69	94-6
1/F	12	12	8,432	702-67	2,275-96	313-20	26-10	93-1
1/G	11	10	8,339	758-09	2,266-78	362-89	32-99	103-2
1/H	13	12-42	9,477-5	729-03	2,220-51	399-95	30-77	93-1
1/I	13	11-10	8,051-5	619-34	1,999-69	339-86	26-14	83-0
1/Jr	15	11-10	8,230	548-67	1,554-80	353-91	23-59	67-1
1/K	14	12-45	12,184-5	870-32	1,850-71	500-45	35-75	94-1
1/Ll	11-10	11-10	6,506	586-12	1,751-89	252-70	22-77	80-6
1/M	15-97	15-97	9,506	595-24	1,803-71	459-80	28-79	94-0
Means	17-04	15-05	10,158-38	596-18	1,855-68	432-32	25-37	87-7

RIVER MURRAY HERD TESTING ASSOCIATION.

List of cows yielding over either 1,000galls. milk or 400lbs. of butterfat during one lactation period.

Owner.	Name of Cow.	Days in Milk.	Milk.	Butterfat.
			Lbs.	Lbs.
C. J. Morris, Monteith	Diana	319	10,119-5	389-2
	Ivy	297	16,850	590-4
M. S. Cheetham, Mypolonga	Cleo	319	10,021	422-2

MOUNT GAMBIER AND DISTRICT HERD TESTING
ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1923.

No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
		Per Herd during December.	Per Cow during December.	Per Cow August to December.	Per Herd during December.	Per Cow during December.	Per Cow August to December.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
15	15	10,292	686-13	2,788-79	415-38	27-70	107-02
8-90	8-10	7,442-5	836-24	4,508-61	291-00	32-70	151-26
17-48	13-81	9,366	534-10	2,867-66	387-85	22-19	104-29
13-71	13	10,764-5	785-16	3,311-73	453-38	33-07	137-21
23	22-81	17,351	754-39	3,518-96	708-56	30-81	132-10
14	14	11,361-5	811-53	3,650-42	457-08	32-65	135-56
12	12	12,028	1,002-33	4,563-68	473-29	39-44	178-99
24	22-32	18,426	767-75	3,229-91	689-31	28-72	117-08
24	19-58	11,335	472-29	2,065-54	538-29	22-43	88-90
36	31-52	19,357	537-69	2,770-53	748-85	20-80	103-49
16	16	17,313-5	1,082-09	5,375-75	682-54	42-66	209-09
6	5	5,347-5	891-25	4,053-95	214-54	25-76	181-37
12	9-39	8,909	742-42	3,991-09	311-69	25-97	146-39
17	17	17,034-5	1,002-03	4,394-39	681-46	40-69	168-34
20-19	20-03	12,583	623-22	2,523-24	514-22	25-47	99-83
17	17	17,158-5	1,009-32	4,861-40	641-72	37-75	171-14
34-94	33-61	31,648	905-78	4,086-94	1,258-32	36-01	144-92
12-58	11-94	10,747-5	854-33	4,154-50	432-42	34-37	161-35
11-29	10-29	8,390	740-47	3,425-02	349-21	30-93	134-25
24-97	24-03	15,712-5	629-35	3,057-86	609-67	24-42	112-45
9	9	6,618-5	735-39	3,099-94	275-65	30-93	113-68
13	13	7,161	550-85	2,646-51	315-12	24-24	107-18
17-37	16-29	13,013-05	749-32	3,449-00	520-43	29-97	130-49

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GLENCOE HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1923.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during December.	Per Cow during December.	Per Cow October to December.	Per Herd during December.	Per Cow during December.	Per Cow October to December.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
3/A	17	14-48	17,543	1,031-94	2,818-19	741-98	43-65	114-2
3/B	16	14-06	8,472	529-50	1,315-49	368-07	23-00	54-2
3/C	12	12	10,261	855-08	2,618-72	400-05	33-34	99-6
3/D	12	8-61	7,312-5	609-37	1,468-25	263-74	21-98	52-8
3/E	15-84	13-35	9,384-5	592-45	1,897-74	420-85	26-57	78-2
3/F	8-42	8-42	6,700	795-72	2,217-97	265-57	31-54	82-3
3/G	10	8-84	8,564-5	856-45	2,457-45	345-65	34-57	88-8
3/H	14-61	13-81	10,608-5	726-11	1,903-63	389-77	26-68	65-2
3/I	12-68	12-68	9,669	762-54	2,082-54	406-38	32-05	81-2
3/J	14	13	7,006	500-43	1,294-83	306-50	21-80	55-5
3/K	23-39	21-84	16,115-5	688-99	2,185-79	704-95	30-14	86-2
3/L	18	18	12,431	690-61	1,931-89	531-80	29-54	70-1
3/M	12	12	7,719	643-25	1,910-54	331-18	27-60	75-8
3/N	19-90	18-52	12,292-5	617-71	1,791-59	539-39	27-11	71-0
3/O	16	13	8,494	530-87	1,497-62	314-47	19-65	52-4
3/P	14	14	9,393	670-93	2,130-00	364-32	26-02	79-5
3/Q	57-52	53-74	44,954	781-54	2,195-61	1,801-52	31-32	85-0
3/R	17	17	12,245	720-29	2,380-29	548-81	32-28	106-5
Means	17-24	15-96	12,175-83	706-16	2,030-91	502-50	29-14	78-8

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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Monday, January 21st, 1924, there being present—Mr. F. Coleman (Acting Chairman), Professor Arthur J. Perkins, Col. Rowell, Messrs. C. J. Tuckwell, H. Wicks, L. Cowan, B.Sc. (Agric.), W. J. Caldebatch, A. M. Dawkins, and the Secretary (Mr. H. J. Finnis).

Variation in Size of Cornsacks.—At the 1923 Congress a resolution was carried “that steps should be taken to prevent the inclusion of bags of other than standard size in bales of cornsacks.” The matter was referred to the Commonwealth Department of Trades and Customs, who supplied the following report:—“Instructions have been issued from time to time to insure that the utmost care be observed with respect to the importation of cornsacks. Samples are taken from each consignment received in order to ascertain whether they comply with the requirements of the Proclamation. The Department points out that it is impossible to examine every bale, but everything that is reasonable is done to protect the importers. In several instances consignments have been detained on account of non-compliance with the terms of the Proclamation.

Planting Trees on Stock Reserves.—The 1923 Congress of the Agricultural Bureau resolved:—“That the Government be urged to evolve some scheme for planting trees on stock reserves.” The Conservator of Forests, to whom the matter was submitted, has supplied the following report:—“The position in this matter is that the planting of stock reserves is surrounded by many weighty disadvantages, and offers no chance for any satisfactory return from a financial standpoint. One great disadvantage arises from the fact that the width of the land usually available does not exceed a quarter of a mile, hence it follows that when allowance is made for a one-chain road on one side and a two-chain road on another (which has been the usual practice), there remains only 17 chains as the width of the land available. This width is out of all proportion to the length, as the reserves usually extend for many miles in succession. If an area one mile long by 17 chains wide be fenced, the length of fencing will be nearly 200 chains, which at £60 per mile will amount to 22s. 6d. per acre for the 136 acres enclosed. It is usual, however, to lay out the area to be planted in as regular a form as possible, and this being so, if the area to be fenced were 640 acres with a boundary of a mile long on all four sides, then the fencing cost at the same rate would only amount to 7s. 6d. per acre for the 640 acres enclosed. The great discrepancy inseparably associated with the contour of the land under consideration is thus apparent. The same reason that so greatly increases the cost of fencing also adds exceedingly to the cost of maintenance and oversight, as so much more travelling and patrolling is necessary owing to the indefinitely prolonged length of the area to be planted on. Residential centres would be imperatively needed at suitable intervals, as it would be futile to leave plantations—started at heavy cost—to the mercy of the many petty trespasses and injuries

that invariably occur if areas of this kind are left without adequate protection and oversight. Again, it will be self evident that the cost of transport of all materials for fencing, planting, and other purposes, especially where a residence is needed, cannot fail to be exceedingly heavy, and the crux of the whole matter is, that in spite of all the expenditure involved, there is no hope whatever of any plantations reared in this way ever returning more than a bare fraction of the cost. It must be further noted that a large number of the stock reserves now existing are situated in localities where both climate and soil condition are absolutely hostile to the growth of timber. Areas planted by the Department under similar circumstances years ago at Redhill, Barunga, Crystal Brook, Ayers, and Yarcowie, when labor and all other costs were far cheaper than they are now, have never given a satisfactory result from a financial point of view. They may certainly have possibly afforded an object lesson to the general public as to how and what to plant, but that is no compensation for the very heavy dead weight they have always proved to be on the Department's funds. Having fully considered this matter from the planting aspect, it is now necessary to regard it from the most prominent point, namely, how planting, if carried out, would affect the main object for which these reserves were created. As the movements of stock are of vital importance to one of the country's main lines of production, travelling stock reserves were set apart for the travelling of stock to various purchasing centres, and cannot be diverted from their original purpose without the consent of both Houses of Parliament. Strong opposition would certainly be experienced from the large body of stockholders concerned to any action in this direction, even if there were any prospects of valuable results being obtained by planting, but when it is abundantly clear that no good end can be attained, it would be highly undesirable to start planting operations on these reserves. Bearing all these considerations in mind, I do not feel justified in recommending that any scheme for planting the stock reserves should be entertained."

Red Wheats.—The 1923 Conference of Murray Lands Branches of the Agricultural Bureau resolved:—"That the Department of Agriculture compile and publish a list of 'red' varieties of wheat, and of 'white' varieties which are likely to prove efficient substitutes for same. The Superintendent of Experimental Work (Mr. W. J. Spafford) to whom this matter was submitted supplied the following information:—"In the Institute of Science and Industry Bulletin, No. 26 (A Classified and Detailed Description of the More Important Wheats of Australia), 82 wheats have been dealt with, and of these the following nine are the only ones which may be described as 'red' wheats:—King's Red, Teakle's Red, Cedar, Marquis, Bomen, Warden, American Eight, Hayne's Bluestem, Dawson's Golden Chaff. Other than the above, Red Russian is the only other 'red' variety grown to any extent in this State, and as a matter of fact there is not much 'red' wheat produced in South Australia, and the great bulk of it would consist of King's Red and Red Russian, both of which varieties could be well replaced by King's White, Sultan, Gluyas, Baroota Wonder, or Walker's Wonder."

Standard Fruit Case.—A suggestion was received that it be made compulsory that fruit cases should be manufactured with soft wood ends. It was decided to seek the opinion of the Fruit Growers' Association on this proposal.

Reports of Refrigeration of Fruit.—The following resolution was carried at the Conference of Hills Branches:—"That reports of the investigations recently carried out relative to the refrigeration of fresh fruit be forwarded to all Branches of the Agricultural Bureau interested in the exportation of apples." The Secretary reported that copies of the report referred to in the resolution were published at 4s. 6d. each. It was decided that Branches interested in the exportation of apples should be advised that copies of the report would be made available on the payment of the cost of procuring same.

Distribution of Seed Wheat.—A communication was received from the Owen Branch asking, "That the Government adopt the New South Wales system of distribution of seed wheat." The Secretary explained that the resolution probably referred to the practice which prevailed in New South Wales, where farmers who were desirous of selling seed wheat could have their crops inspected by an officer of the Department of Agriculture. If favourably reported on, a notice was published in the New South Wales Agricultural Gazette drawing attention to the fact that good, clean, and true to type seed could be obtained from that farmer. The Board recognized that the adoption of that system in South Australia would mean an increase in the

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work of the technical staff of the Department to cope with the inspection of the crops, but decided to recommend it to the Government as the best method that had come under their notice of increasing the quantity of seed available to farmers.

Confidence in Departmental Officers.—The following resolution was received from the Coomandook Branch:—"That the members of this Branch of the Agricultural Bureau generally regret the unwarranted attacks made recently in Parliament on the Agricultural Department. Our experience has been that the Director of Agriculture and other members of the staff have promptly responded to every request from us for advice and addresses." The Secretary was instructed to thank the Branch for their expression of confidence.

Drainage of the Berri Orchard.—At a recent meeting of the Berri Branch it was resolved:—"That the Department of Agriculture be urged to use all expedition in draining that portion of the Berri Orchard under vine manurial experiments as the spread of seepage now visible will seriously affect the value of the experiments being so ably conducted by Mr. Savage." The Secretary was instructed to advise the Branch that the work is already in hand.

Interstate Departmental Officers at Country Conferences.—A communication was received from the Lone Gum and Monash Branch asking what action was taken by the Advisory Board in securing the attendance of officers of the Departments of Agriculture of other States at Agricultural Bureau Conferences. It was decided that the Branch should be informed that the members of the Mildura Research Committee who attended the River Murray Conference, which was probably the case which the Branch had in mind, were present at the express wish of the Renmark Branch of the Agricultural Bureau.

Inspection of Apple Packing Sheds.—It was decided to refer the request of the Balhannah Branch that the Government arrange for inspection in packing sheds of apples for export to the Horticultural Instructor for a report.

Underground Water Supplies for Irrigation.—The Tantoola Branch requested that an expert be sent to this locality to report on "the feasibility of utilising the millions of gallons of water now running to waste" for summer irrigation, and to advise the Department as to whether an experimental plot might not be possible to demonstrate the potentialities of the district in this respect. The Secretary was instructed to confer with the Director in order that a reply to the request might be forwarded to the Branch.

Cold Storage of Dried Fruits.—Mr. C. J. Tuckwell in bringing the matter of the cold storage of dried fruit under the notice of the Board said:—It was recently stated in the press that it was proposed in England to try cold storage as a deterrent of the grubs that affect dried fruits. In October last the London quotation for three-crown Australian sultanas was 58s. per cwt. sellers. Speaking from memory he thought that sales were not effected until the price came down to about 50s. By the time freight and charges and 10s. per cwt. duty were paid there was precious little left for the growers

but a bad reputation with the British consumer. The fruit was reported as "maggotty." The months of greatest demand for sultanas, currants, and lexias were November and December. In December, 1922, he saw Australian sultanas in grocers' windows in London quite candied and showing at a decided disadvantage against the fresh-looking goods from the Mediterranean, which had recently arrived on the market. His experience had been that in South Australia the grubs did not appear in the fruit until about the end of the year. The voyage through the tropics and the summer weather on arrival in England evidently favoured the earlier hatching of the eggs. It seemed feasible that cold storage in transit and at the other end would prevent the eggs from hatching; and if, until the winter, say November, fruit were only taken from cold store as it was required, there should not be any trouble with grubs. During the English winter the eggs were not likely to hatch. In addition to checking the grubs it was possible that cold storage would prevent the fruit becoming candied. The dried fruit industry was of such importance to South Australia that he thought experiments dealing with the matter should be carried out. To make a thorough test, arrangements should be made with one of the packing sheds to have a homogeneous sample of sultanas packed in a number of cases, not necessarily so large as 56lbs. each, and such arrangements should be made at once, as the fruit season was approaching. There should be sufficient cases to test storage at different temperatures, such as in apple chambers and meat chambers; also that different boxes could be opened and examined after various periods of storage. The extra cost of marketing cold-stored fruit should be ascertained. Any steps likely to improve the condition of dried fruit when it reached the market were of such vital importance to soldier settlement on the Murray that the matter should be treated as urgent. It was decided to ask the Horticultural Instructor for a report on the matter.

Welcome to Mr. Cowan.—The Chairman extended a welcome to Mr. L. Cowan—a member of the Board who has recently been on an extended tour of other countries.

Life Membership.—The name of Mr. J. Potter, of the Clarendon Branch, was added to the roll of Life Members of the Agricultural Bureau.

New Members.—The following names were added to the rolls of existing Branches:—Waikerie—A. Jones, G. M. Arnold, A. R. Thompson, R. G. Gill, K. P. Thompson, E. J. Burrows, F. S. Oldhin, E. Francies; Roberts and Verran—W. H. Whittaker; Mannanarie—F. M. Frost, T. A. Quinn, C. N. Bretag; Allandale East—C. D. C. Kennedy; Mundalla—R. Saxon, S. S. Sanderson; Coonalpyn—C. J. S. Carpenter; Barmora—H. H. McCarthy, D. S. Murphy, A. C. George; Rapid Bay—N. Mathew, H. Cole, W. Collins, Rev. Lawson; Light's Pass—G. A. Bender; Winkie—E. C. Goodrich; Rapid Bay—A. Stacey; Balhannah—A. W. Mattner; McLaren Flat—A. Fraser, G. Bell, C. Chapman; Kringin—E. C. Thompson, A. F. Hurford; Whyte-Yarcowie—S. Napper; Tantoola—W. R. Warren, H. Kennedy.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR FEBRUARY, 1924.

[By C. H. BEAUMONT, Instructor and Inspector.]

February should be the month of results. Some of the soft fruits will have been dealt with, and the time comes for packing for export. Apples are the main export line so far. There is still room for great improvement in picking and packing. We must get the fact before us that it is the consumer that matters; if he is satisfied there is increased demand, and there is a lessened demand when the pack opens up badly. I have had the opportunity of seeing Californian apples handled, graded, and packed, and I must admit that we do not approach their standard. They have good, well made boxes; they have well equipped packing sheds, and only good grade fruit is sent in by the growers. The boxes are attractive and the fruit in them is true to the brand on the box. The best fruit is available for their own people, who do not fail to send in big orders, knowing that they may rely on getting the fruit they send for and pay for. I handled thousands of apples and did not find a grubby one or a scabby one. We have fruit which is equal in every way to theirs; they have just as many diseases to contend with as we have, and there is no reason why we should not market as good or better samples than they do. The wonderful method of co-operation is a great factor in the successful handling of the fruit crop.

Keep on spraying apples of late varieties to protect them from codlin; use a high pressure pump and well mixed material. Arsenate of lead powder is the best material we have used, and if a little flour is added (4lbs. per 100galls.) it will spread better and be more efficient.

Ripe, soft fruit should be picked on to trays for immediate sale.

Mark the trees bearing the best fruit so that you will know where to go for grafting wood.

Citrus trees and young or newly planted trees will need water. Give them as much as the soil will soak up readily and remain friable, but not enough to make it boggy. Loosen the soil as soon as possible after irrigation.

Watch vines for oidium and use the finest sulphur for dusting, or lime-sulphur spray. Against downy mildew Bordeaux mixture is the preventive.

**IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.,
DECEMBER, 1923.**

IMPORTS.

Interstate.

Apples (bushels)	1,791
Bananas (bushels)	7,875
Cherries (bushels)	2
Cucumbers (bushels)	105
Gooseberries (packages)	2
Lemons (packages)	4
Oranges (bushels)	4
Passion fruit (bushels)	13
Peaches (packages)	3
Plums (packages)	1
Peanuts (packages)	3
Onions (bags)	252
Potatoes (bags)	8,281
Bulbs (packages)	17
Plants (packages)	37
Seeds (packages)	5
Wine casks (empty)	3,373

Rejected—69bush. bananas, 2bush. apples.

Fumigated—6 packages plants.

Overseas.

Federal Quarantine Act.

Five thousand nine hundred and eighty-two packages seeds, &c.

EXPORTS.

Federal Commerce Act.

Six hundred and eighteen packages of dried fruit were exported to overseas markets. These were consigned as follows:—

London.

Dried fruit	222
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New Zealand.

Dried fruit	120
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South Africa.

Dried fruit	202
-----------------------	-----

Vancouver.

Dried fruit	1
-----------------------	---

India and East.

Dried fruit	73
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THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF JANUARY.

Booborowie.—Weather—The weather for January has been extremely cold and unseasonable, and up to the time of writing 143 points of rain have been registered. Crops—The lucerne crops on the Booborowie flat are looking remarkably well. Natural feed is plentiful. Stock—Livestock are all in good healthy condition. Miscellaneous—Farmers are still trying to complete harvest operations against great odds.

Eyre.—Weather—Exceptionally bad harvesting weather has been experienced, and farmers have only been able to harvest for half a day during some weeks. Crops—Harvesting has at last been completed, and some very satisfactory yields have been recorded. A number of the oat varieties on small areas have touched the 40bush. mark. Natural feed has dried off in most parts, but is sprouting on areas where thunderstorms have been heavy. Pests—Rabbits are becoming very numerous.

Kybybolite.—Weather—January has been a comparatively cool month, very few real hot days being experienced. Light rain fell on 12 days during the month, registering a total of 92 points, which is about double the average for the month. Winds have been principally from the west and south-west. Crops—All winter crops have been harvested, but mostly poor yields have been received. Wheat yields were poor; some oat crops yielded above the average. Early spring-sown barley and peas gave the best returns. Summer crops have made good growth during the month, especially maize, sunflowers, and turnips. The cool conditions have kept sorghum varieties back. Sudan grass has grown really well. Natural feed is in very fair quantity. English dandelion is becoming plentiful in some fields, and wireweed is thick in others. Mother Dutton is also fairly thick on some stubbles. Stinkwort is becoming a nuisance on some fields. Stock are in good health; spring lambs have grown really well. Miscellaneous—The underground irrigation water supply is very good this summer, the water level being 8in. higher than in previous years.

Turretfield.—Weather—The early portion of the month was very wet for this season of the year, and altogether the month has been very cool. Rain fell on 11 days. Nearly all the crops are harvested; only a little hay remains uncut. The yields, both of hay and grain, have been poor, and the returns for most farms much below the average. Natural Feed—There is little natural feed except wiregrass, which is thick in the stubbles. Stock is in fair to good condition. Pests—Birds are very troublesome in the vineyards and gardens. Minahs are very numerous. Miscellaneous—The growth of blanket weed and stinkwort is very strong, and will give much trouble to those putting in stubble land.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report of February 1st, 1924:—

BUTTER.—Unexpectedly this State continued to export a surplus of all grades of butters to interstate and overseas buyers, the length of the season being greatly assisted by the late rains and the wonderfully cool weather for this time of the year. Since our last report several fluctuations in values have taken place on account of the variation in the London market. Choicest factory and creamery fresh butter in bulk, 1s. 6½d.; prints, ½d. extra; first-grade butter in bulk, 1s. 5½d.; second-grade bulk, 1s. 3d.; third grade, 1s. 2½d.; best separators and dairies, 1s. 3½d. to 1s. 5½d.; fair quality, 1s. 2½d. to 1s. 3d.; store and collectors' of good condition, 1s. 1d. to 1s. 2½d.; heated lots, 1s. to 1s. 0½d. per lb.

EGGS.—Values throughout the month have remained practically stationary until the last two markets, when an advance of 2d. per dozen was recorded. At our auction extensive quantities were submitted, and were readily cleared either to local or interstate operators. Fresh hen, 1s.; duck, 1s. 1d. per dozen.

CHEESE.—During the month large supplies have been consigned from the South-Eastern factories weekly, and in sympathy with the lower quotations which the eastern States—especially Victoria—were offering at, values eased approximately ½d. per lb. However, at the lower prices all consignments have been readily absorbed by local buyers, with limited sales to Western Australia, the range being ½d. to 1s. 0½d. per lb. for large to loaf; semi-matured large, 1s. 1d.; semi-matured loaf, 1s. 2d.; fully matured, 1s. 3d. per lb. for large size.

HONEY.—Stocks throughout Australia appear to be light, as very strong interstate inquiries have existed for the past few weeks, and the market has advanced ½d. per lb. since our last quotations. The new season's prime clear extracted in liquid condition is realising 5d. per lb.; best candied lots, 4½d. per lb.; lower grades down to 2½d., according to quality; beeswax for clear samples, 1s. 4d. per lb.

ALMONDS.—The quantities coming to hand have been about equal to the demand, with values slightly easier on account of the lower quotations at which importations can be made. Brandis, 8½d. to 9d.; mixed softshells, 7½d. to 8d.; hardshells, 1d. to 4½d.; kernels, 1s. 5½d. to 1s. 6d.; walnuts, 1s. per lb.

BACON.—Some difficulty has been experienced by merchants in securing their supplies of middles and rolls, and parcels have had to be brought from Victoria to fulfil sales, whilst with sides excellent demand has ruled at unaltered rates. Most curers have large supplies of hams left over from the Christmas trade, and as the demand is dull prices have receded 3½d. to 4d. per lb. Best factory cured sides, 1s. 3d.; middles, 1s. 5½d. to 1s. 6d.; rolls, 1s. 2d.; hams, 1s. 4d. to 1s. 4½d.; Hutton's "Pineapple" hams, 1s. 9d. Lard—Hutton's "Pineapple" brand in packets, 1s.; in bulk, 11d. per lb.

LIVE POULTRY.—As is usual in this month the supplies are short, the majority of consignors having forwarded their surplus birds for the Christmas sales, the result being that enhanced values were realised for all lots submitted, especially for prime-conditioned young roosters. The catalogues throughout the month consisted of fairly good class birds, and as buyers were in good attendance and excellent competition ruling, each pen sold at satisfactory prices to consignors. At present there is a shortage of turkeys, and high values are obtainable where birds are of good condition. We advise consignors to forward at earliest. Crates obtainable on application. The following rates ruled at the close of the month:—Prime roosters, 5s. to 7s. 6d. each; nice-conditioned cockerels, 3s. 6d. to 4s. 9d.; poor-condition cockerels, 2s. 9d. to 3s.; plump hens, 3s. 6d. to 5s.; medium hens, 3s. 3d. to 3s. 3d.; poor-condition hens, 1s. 6d. to 2s.; some pens of weedy sorts over; geese, 5s. 3d. to 7s. 3d.; ducks, good condition, 4s. 6d. to 6s. 6d.; ducks, fair condition, 2s. 5d. to 4s.; turkeys, good to prime condition, 1s. 1d. to 1s. 8d. per lb. live weight; turkeys, fair condition, 11d. to 1s. 0½d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 6d. each.

POTATOES.—Victorian and Mount Gambier potatoes have been realising from 2s. to 10s. 6d. per cwt. on rail Mile End.

ONIONS.—Best-quality white onions, 9s. per cwt. on rail.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall of the subjoined stations for the month of and to the end of January, 1924, also the average precipitation to the end of January, and the average annual rainfall.

Station.	For Jan., 1924.	Av'ge To end Jan., 1924.	Av'ge. Annual Rainfall	Station.	For Jan., 1924.	Av'ge To end Jan., 1924.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				LOWER NORTH—continued.			
Oodnadatta	0.70	0.69	4.94	Spalding	1.37	0.62	20.27
Marree	0.98	0.45	6.07	Gulnare	1.25	0.68	19.36
Farina	0.81	0.55	6.66	Yaaka	1.27	0.52	15.46
Copley	0.60	0.65	8.39	Koolunga	1.32	0.62	15.89
Beltana	0.19	0.71	8.97	Snowtown	1.08	0.62	16.07
Blinman	0.22	1.02	12.53	Brinkworth	1.29	0.49	16.30
Tarcoola	0.55	0.38	7.74	Blyth	2.24	0.69	17.03
Hookina	0.20	0.68	13.46	Clare	1.99	0.86	24.68
Hawker	0.35	0.65	12.92	Mintaro	1.63	0.59	23.57
Wilson	0.40	0.69	12.58	Watervale	1.72	0.91	27.54
Gordon	0.74	0.73	11.55	Auburn	1.60	1.00	24.35
Quorn	0.56	0.73	14.21	Hoyleton	0.88	0.77	17.91
Port Augusta	1.00	0.57	9.67	Balaklava	0.87	0.72	15.95
Port Augusta West	0.72	0.54	9.71	Port Wakefield	0.68	0.58	13.28
Bruce	0.68	0.54	10.77	Terowie	0.97	0.72	13.82
Hammond	0.91	0.69	11.91	Yarcowie	0.93	0.73	14.22
Wilmington	1.41	0.90	18.39	Hallett	1.27	0.72	16.49
Willowie	1.14	0.55	12.57	Mount Bryan	1.59	0.52	16.81
Melrose	2.01	1.26	23.40	Koorunga	1.65	0.76	18.08
Booleroo Centre	1.21	0.83	15.65	Farrell's Flat	1.70	0.74	19.00
Port Germein	1.41	0.68	12.89	WEST OF MURRAY RANGE.			
Wirrabara	1.24	0.73	19.78	Manoora	1.42	0.58	18.92
Appila	1.66	0.65	15.00	Saddleworth	1.54	0.76	19.78
Craddock	0.40	0.65	11.52	Marrabel	1.39	0.72	19.75
Carrieton	0.81	0.84	12.90	Riverton	1.30	0.79	20.79
Johnburg	0.57	0.63	10.91	Tarlee	1.37	0.79	17.93
Eurelia	0.80	0.82	13.54	Stockport	1.04	0.79	16.63
Orroroo	0.69	1.04	13.73	Hamley Bridge	1.05	0.82	16.39
Nackara	0.78	0.74	11.99	Kapunda	1.37	0.85	19.89
Black Rock	0.74	0.74	12.75	Freeling	1.17	0.77	17.99
Ucolta	0.70	0.76	12.04	Greenock	1.57	0.79	21.68
Peterborough	1.04	0.84	13.53	Truro	1.76	0.73	20.20
Yongala	1.18	0.67	14.58	Stockwell	1.51	0.73	20.32
LOWER NORTH-EAST.				Nuriootpa	1.37	0.80	21.00
Yunta	0.48	0.70	8.88	Angaston	1.51	0.80	22.53
Waukaringa	0.46	0.57	8.54	Tanunda	1.47	0.85	22.24
Mannahili	0.48	0.73	8.67	Lyndoch	1.48	0.77	22.93
Cockburn	0.80	0.66	8.31	Williamstown	1.09	0.91	27.48
Broken Hill, N.S.W.	0.77	0.71	9.98	ADELAIDE PLAINS.			
LOWER NORTH.				Mallala	1.01	0.75	16.72
Port Pirie	1.49	0.64	13.55	Roseworthy	1.12	0.75	17.35
Port Broughton	1.31	0.62	14.29	Gawler	1.19	0.73	19.11
Bute	1.08	0.63	15.78	Two Wells	0.65	0.71	15.88
Laura	1.27	0.73	18.26	Virginia	0.47	0.73	17.32
Caltowie	1.71	0.69	17.20	Smithfield	0.68	0.53	17.24
Jamestown	1.65	0.67	17.89	Salisbury	0.67	0.73	18.51
Bundaleer W. Wks.	1.17	0.70	18.09	North Adelaide	0.83	0.82	22.37
Gladstone	1.86	0.67	16.29	Adelaide	0.71	0.73	21.66
Crystal Brook	2.02	0.69	15.95	Glenelg	0.11	0.65	18.45
Georgetown	1.59	0.69	18.55	Brighton	0.42	0.66	21.37
Narridy	1.24	0.59	16.37	Mitcham	0.88	0.89	24.26
Redhill	1.32	0.59	16.94	Glen Osmond	0.86	1.00	25.34
				Marill	1.08	0.88	25.53

RAINFALL—continued.

Station.	For Jan., 1924.	Av'ge To end Jan., 1924.	Av'ge. Annual Rainfall	Station.	For Jan., 1924.	Av'ge To end Jan., 1924.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				WEST OF SPENCER'S GULF—continued.			
Teatree Gully.....	1-22	0-89	27-77	Talia.....	0-34	0-31	15-32
Spiridon West.....	2-77	1-57	46-82	Port Elliston.....	0-26	0-39	16-56
Uraidla.....	2-39	1-39	44-23	Cummins.....	0-06	0-51	18-50
Clarendon.....	1-11	1-16	33-08	Port Lincoln.....	0-31	0-59	19-66
Morphett Vale.....	0-64	0-82	22-90	Tumby.....	0-18	0-30	14-56
Noarlunga.....	0-34	0-64	20-41	Carrow.....	0-26	0-40	14-42
Willunga.....	1-27	0-79	25-99	Arno Bay.....	0-59	0-35	13-06
Aldinga.....	0-81	0-61	20-44	Cowell.....	0-50	0-45	11-63
Myponga.....	1-02	0-70	29-80	Minnipa.....	1-08	1-08	15-51
Normanville.....	0-51	0-58	30-70				
Yankalilla.....	0-43	0-60	23-31	YORKE PENINSULA.			
Mount Pleasant.....	0-95	0-87	27-28	Wallaroo.....	0-74	0-55	14-15
Birdwood.....	1-12	1-10	29-39	Kadina.....	0-98	0-51	16-02
Gumeracha.....	1-48	1-10	33-36	Moonta.....	0-63	0-52	15-35
Millbrook Reservoir.....	1-86	1-24	36-21	Green's Plains.....	0-71	0-53	15-86
Tweedvale.....	1-23	1-06	35-65	Maitland.....	0-87	0-62	20-17
Woodside.....	1-04	1-03	32-20	Ardrossan.....	0-32	0-52	14-18
Ambleside.....	1-79	1-14	34-82	Port Victoria.....	0-42	0-48	15-50
Nairne.....	1-38	0-98	28-44	Curramulka.....	0-27	0-61	18-20
Mount Barker.....	1-36	1-05	31-30	Minlaton.....	0-32	0-53	17-90
Echunga.....	1-64	1-10	33-06	Brentwood.....	0-16	0-41	15-83
Macclesfield.....	1-01	0-91	30-65	Stansbury.....	—	0-62	17-01
Meadows.....	1-71	1-09	36-19	Warooka.....	0-15	0-46	17-80
Strathalbyn.....	1-03	0-70	19-36	Yorketown.....	0-27	0-49	17-24
				Edithburgh.....	0-22	0-53	16-58
MURRAY FLATS AND VALLEY.				SOUTH AND SOUTH-EAST.			
Meningie.....	0-71	0-65	18-74	Cape Borda.....	0-48	0-62	25-08
Milang.....	0-57	0-65	15-45	Kingstote.....	0-34	0-47	19-04
Lanzhorne's Creek.....	0-28	0-47	14-77	Penneshaw.....	0-43	0-52	19-47
Wellington.....	0-52	0-75	14-80	Victor Harbor.....	0-58	0-73	21-49
Tailem Bend.....	0-49	0-48	14-68	Port Elliot.....	0-73	0-67	20-12
Murray Bridge.....	0-53	0-59	13-94	Goolwa.....	0-44	0-66	17-89
Callington.....	0-94	0-70	15-49	Pinnaroo.....	0-71	0-41	15-50
Mannum.....	0-46	0-52	11-66	Parilla.....	0-16	0-45	14-51
Palmer.....	0-31	0-48	15-46	Lameroo.....	0-50	0-55	16-32
Sedan.....	0-95	0-54	12-27	Parrakie.....	0-75	0-38	14-58
Swan Reach.....	0-65	0-36	11-06	Geranium.....	0-74	0-40	16-62
Blanchetown.....	0-91	0-52	10-09	Peake.....	0-68	0-55	16-73
Eudunda.....	1-41	0-70	17-51	Cooke's Plains.....	0-90	0-54	15-14
Sutherlands.....	1-27	0-34	11-20	Coomandook.....	0-77	0-51	17-49
Morgan.....	1-06	0-49	9-30	Coonalpyn.....	0-63	0-68	17-40
Waikerie.....	0-97	0-31	9-87	Tintinara.....	0-69	0-50	18-70
Overland Corner.....	0-86	0-50	11-03	Keith.....	0-51	0-36	18-22
Lexton.....	1-15	0-50	12-50	Bordertown.....	0-62	0-75	19-39
Rennmark.....	0-82	0-49	11-06	Wolsley.....	0-61	0-61	18-12
Monash.....	0-89	0-53	—	Frances.....	0-98	0-69	19-73
WEST OF SPENCER'S GULF				Naracoorte.....	0-81	0-80	22-56
Eucala.....	0-08	0-59	1-01	Penola.....	1-14	1-02	26-26
White Well.....	0-07	0-42	9-20	Lucindale.....	0-93	0-71	23-00
Fowler's Bay.....	0-19	0-39	12-14	Kingston.....	1-16	0-73	24-51
Penong.....	0-20	0-36	12-53	Robe.....	1-10	0-79	24-69
Ceduna.....	0-30	0-26	10-25	Beachport.....	0-68	0-89	27-20
Smoky Bay.....	0-35	0-29	10-98	Millicent.....	1-42	0-94	29-39
Petina.....	0-28	0-36	12-95	Kalangadoo.....	1-78	0-93	32-47
Streaky Bay.....	0-27	0-44	18-07	Mount Gambier.....	1-49	1-36	31-29

AGRICULTURAL BUREAU REPORTS.

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Aldinga	•	—	—	Glencoe West	•	—	—
Allandale East	722	—	—	Glossop	†	27	28
Amyton	•	18	24	Goode	•	23	19
Angaston	•	—	—	Green Patch	•	18	17
Appila-Yarrowie	•	—	—	Gumeracha	•	18	24
Artherton	•	—	—	Halidon	•	—	—
Ashbourne	•	—	—	Hartley	720	20	19
Balaklava	•	9	8	Hawker	•	19	18
Balhannah	716	15	14	Hilltown	•	—	—
Barmera	•	18	17	Hookina	702	21	20
Beetaloo Valley	•	—	—	Inman Valley	•	—	—
Belalie North	•	16	16	Ironbank	•	16	15
Berri	714	20	19	Kadina	•	—	—
Bethel	704	—	—	Kalangadoo (Women's)	•	9	8
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Blackwood	•	18	17	Keith	•	—	—
Block E	•	—	—	Ki Ki	•	—	—
Blyth	•	2	1	Kilkerran	•	21	20
Booleeroo Centre	•	15	21	Kimba	•	—	—
Borrika	•	21	20	Kingston-on-Murray	•	—	—
Brentwood	•	16	15	Kongorong	†	21	20
Brinkley	•	—	—	Koonibba	•	15	21
Bundaleer Springs ..	•	—	—	Koppio	•	18	17
Bute	•	19	18	Kringin	716	—	—
Butler	707	—	—	Kybyholite	•	21	20
Calca	•	—	—	Lake Wangary	•	16	15
Cadell	•	—	—	Lameroo	•	22	21
Canowie Belt	•	—	—	Laura	•	23	22
Carrow	•	20	19	Lenswood and Forest Range	•	—	—
Cherry Gardens	722	19	18	Light's Pass	•	—	—
Glanfield	•	—	—	Lipson	•	—	—
Clare	•	18	17	Lone Gum and Monash	708	20	19
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Cleve	•	—	—	Loxton	•	—	—
Collie	•	—	—	Lucindale	•	—	—
Colton	•	29	28	Lyndoch	•	21	20
Coomandook	714	20	19	McLeachlan	•	—	—
Coomalpyn	707, 716	22	21	McLaren Flat	†	—	—
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Crystal Brook	•	16	15	Maitland	•	21	20
Cungena	•	—	—	Mallala	•	18	17
Curreney Creek	•	22	21	Maltee	•	16	21
Cygnat River	718, 722	21	20	Mangalo	•	—	—
Darke's Peak	•	—	—	Mannanarie	704	21	20
Denial Bay	•	—	—	Marama	•	—	—
Edillilie	•	23	29	Meadows	•	20	19
Elbow Hill	•	26	25	Meningie	•	—	—
Eurelia	•	—	—	Milang	•	9	8
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Frances	•	23	29	Miltalie	•	16	15
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		Feb.	Mar.			Feb.	Mar.
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Monarto South	*	—	—	Rosedale	*	—	—
Moonta	*	15	21	Rosy Pine	*	—	—
Mooreak	*	21	20	Saddleworth	*	—	—
Moorlands	*	—	—	Saddleworth (Women's)	*	12	11
Moorook	*	18	24	Salisbury	*	5	4
Morchard	*	16	15	Salt Creek	*	—	—
Morphett Vale	*	21	20	Sandalwood	*	—	—
Mount Barker	*	20	19	Shoal Bay	*	19	18
Mount Bryan	*	—	—	Smoky Bay	*	—	16
Mount Bryan East ..	*	—	—	Spalding	*	—	—
Mount Compass	*	—	—	Stockport	*	22	21
Mount Gambier	724	9	8	Streaky Bay	*	—	—
Mount Hope	*	16	15	Strathalbyn	*	19	18
Mount Pleasant	721	—	—	Talia	*	11	10
Mount Remarkable ..	*	—	—	Tantanoola	†	16	15
Mount Schank	*	19	18	Tapian	*	19	18
Mundalla	*	20	19	Tarcowie	*	19	18
Murray Bridge	*	—	—	Tarlee	*	R	—
McColonga	*	20	19	Tatiara	*	16	15
Myponga	*	—	—	Tweedvale	722	21	20
Myria	*	16	15	Two Wells	*	—	—
Nantawarra	*	21	20	Uraidla & Summertown	*	4	3
Naracoorte	724	9	8	Veitch	*	—	—
Narriby	*	23	22	Virginia	*	—	—
Narrung	*	23	22	Waikerie	*	—	—
Neeta	*	—	—	Wall	*	—	—
Nelshaby	*	16	15	Wanbi	*	—	—
Netherton	*	15	21	Warcoowie	*	—	—
North Booborowie ..	*	R	11	Watervale	*	—	—
North Bundaleer	*	—	—	Weavers	†	18	17
Northfield	*	—	—	Wepowie	*	19	18
Nunkeri and Yurgo ..	*	3	2	Whyte-Yarcowie	702	—	—
O'Loughlin	*	20	19	Wilkawatt	*	16	15
Orroroo	702	—	—	Williamstown	*	6	5
Owen	*	15	21	(Women's)	*	—	—
Parilla	*	15	21	Williamstown	*	16	21
Parilla Well	*	18	24	Willowie	*	20	19
Parrakie	*	—	—	Wilmington	*	20	19
Paruna	*	—	—	Windsor	*	—	—
Paskeville	*	15	21	Winkie	*	—	—
Pata	*	—	—	Wirrabara	704	—	—
Penola	*	2	1	Wirrega	*	—	—
Petina	*	23	23	Wirrilla	*	16	15
Pinnaroo	R	15	15	Wirrulla	*	—	—
Pompoota	*	13	12	Wolowa	*	—	—
Poochera	*	2	1	Wookata	*	—	—
Port Broughton	*	15	21	Wudinna	*	—	—
Port Elliot	*	20	19	Wynarka	*	—	—
Port Germein	*	23	22	Yacka	*	19	18
Pygery	*	16	15	Yadnarie	706	19	18
Ramco	710	18	17	Yallunda Flat	*	—	—
Rapid Bay	†	2	1	Yaninee	*	—	—
Redhill	*	—	—	Yeelanna	*	16	16
Rendelham	*	—	—	Yongala Vale	*	—	—
Renmark	710	20	19	Yorketown	*	—	—
Riverton	*	21	20	Younghusband	*	21	20
Riverton (Women's) ..	*	—	—				
Roberts and Verran ..	705	21	20				

* No report received during the month of January. † Held over until next month. R. Reces.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS. UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

December 20th.—Present: 11 members and five visitors.

PLOUGH *versus* CULTIVATOR FOR FALLOWING.—A member read a paper from the *Journal of Agriculture* dealing with this subject, and in the discussion that followed Mr. P. Kelly said he had found the disc cultivator the best, and on sandy ground preferred that implement to the plough for fallowing. Mr. J. O'Connor favored the plough for fallowing, but used the cultivator for working the land the second time. Members generally were of the same opinion as Mr. O'Connor. The cultivator took a wider strip, but did not do such good work as the plough, and caused more lost time after rain, &c.

ORROROO, December 22nd.—A paper dealing with the subject, "Power and Transmission of Power," was read by Mr. G. Graham.

Advice has been received from the Hon. Secretary of the Orroroo Branch (Mr. H. G. Matthews) that it is proposed to hold an Agricultural Show under the auspices of the local Branch of the Agricultural Bureau early in March, 1924.—[Editor.]

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

November 19th.—Present: 10 members.

CONSERVATION OF FODDER.—The following paper was contributed by Mr. P. J. McEntee:—"The subject of fodder conservation in a State subject to periodical droughts is one of the very greatest importance to farmers. Most of the members of this Branch have experienced the difficulties of procuring the fodder necessary to keep the livestock on the farm alive during bad seasons, to say nothing of the abnormal prices they have had to pay at such times. The aftermath of such visitations is usually a greatly depleted bank balance or perhaps even an overdraft. I have noticed, in different parts of the State, that in years of drought some farmers have had sufficient fodder for their own needs and have also supplied their less fortunate neighbors. These men may have been lucky; but it is more than probable that they looked ahead. The purpose of this paper is to bring home to members, if possible, the necessity for making provision for lean years, for it seems that each succeeding drought finds many unprepared. Hay is the most important method of conserving fodder on the average farm, and I propose to deal with that first. The area intended for the hay crop should be selected at seedling time, and should be sown with a wheat of an early variety at the rate of not less than 1bush. to the acre. In a district where 80lbs. of superphosphate is the average dressing, at least 1cwt. (or more) should be used on the hay area. This will ensure a heavier growth. The hay-ground should be rolled—not necessarily at

seeding time—so that a comparatively level surface may be secured for the binder. It also makes for cleanliness—an important factor in the feeding of animals. Further, the binder may be set lower, ensuring a maximum cut. The hay should be cut when just on the turn to ripening. Careful stooking repays the extra hours spent on this work, for the farmer often has to interrupt the haymaking to start reaping, and a well-built stook will run the rain off the sheaves. On the other hand, carelessly stooked hay on which rain has fallen may very well become the breeding-ground of fungi that may seriously affect the health of the horses, or even prove fatal to them. For the bed of the stack, either timber or straw may be used. Care should be taken in building the stack, and all stacks should be thatched properly, beginning at the eaves and working up, or failing that, they should be covered with straw. On every farm should be constructed a mouseproof hay-stand, say 40ft. x 18ft. This would take, say, 20 sheets of iron, 120ft. Oregon or hardwood, and about 20 jarrah uprights. Now comes the problem of providing a double supply of hay in any one year. It could be overcome by making special provision at seeding time. The question arises, too, of the time this particular hay should remain in the stack; but, however long it remains there, no farmer will be anxious for a drought in order to use his reserve supplies of fodder. Straw, too, may be stacked yearly, and this will be found valuable, especially in bad seasons. When strippers were in general use, cocky chaff was invariably conserved, and I have known it to comprise the morning, noon, and evening meals of the horses during seeding and fallowing times. It was damped and seasoned with bran and pollard, or crushed or boiled wheat. There are various carriers attached to harvesters, but as to their utility I am not in a position to speak. However, it seems that if cocky chaff could be conserved, it would prove a boon in time of need. Another fodder, lucerne, may be stored very easily. If stacked like ordinary loose hay it keeps very well. One other fodder may be mentioned—peas. Those who keep sheep should grow peas. They are valuable fattening food, materially increase the carrying capacity of the land, and may be cut and stacked for use when feed is scarce."

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In the discussion that followed, Mr. G. McGregor advocated the sowing of from 1½ bush. to 1 bush. of seed to the acre for the hay crop, because the harvester was responsible for a good deal of cracked and damaged grain. Mr. A. Green considered that hay was the best means of conserving fodder. He also thought that a stand built of short posts covered with pieces of iron, and a floor of strong timber, would successfully combat the mice. Mr. S. Hunt always made a practice of keeping at least 12 months' supply of hay on hand. Mr. Napper thought the crop should be harrowed after it was up, instead of rolled. Mr. Robinson preferred hay cut a little on the green side for stacking, in order to reduce to a minimum the havoc caused by mice. Mr. K. Keatley suggested erecting a stack of straw and sprinkling it with molasses. Mr. McCallum favored the suggestion of the previous speaker, and said a stack of straw would be most useful in keeping young and spare stock in good condition through the winter.

WIRABARA (Average annual rainfall, 18.91 in.).

December 22nd.—Present: 11 members and visitors.

LUCERNE ON THE FARM.—Mr. A. R. Woodland, who contributed a paper dealing with his subject, expressed the opinion that lucerne was one of the best fodder plants, and it was surprising how few farms had a plot of land devoted to its cultivation. Lucerne was rather particular in its soil requirements, yet the majority of farms had land on which the crop could be grown successfully if given the proper treatment. The land on which it was intended to plant the lucerne should be ploughed during the winter and be kept free from weeds by subsequent cultivation until the following April, when the seed should be sown at as shallow a depth as possible. If the seed drill was used for that purpose, the hoes should be allowed to run on the surface of the soil, and the seed would germinate immediately after the first rain. At that time weeds would also make an appearance, but they should not be touched until the spring time. Early in the spring the whole plot should be mowed as closely to the ground as possible. The lucerne would then be able to make some headway, and the second year it should produce a good crop of excellent feed. Subsequent cultivation consisted in scarifying the land early every winter with a narrow tyne cultivator, and drilling in from 2 cwt. to 3 cwt. of super to the acre. After the crop had been cut it should be allowed to remain on the land until thoroughly dry, when it should be raked and stacked without any loss of time. The stack should be covered with galvanized iron, because the small outlay required for the erection of the shed would be saved many times over in the elimination of waste due to the rain getting in to the stack.

MANNANARIE, November 22nd.—Mr. L. F. Gerke read a valuable paper, "Kitchen Gardening," and an interesting discussion ensued. Several questions of local importance were also brought before the meeting.

LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT.)

BETHEL.

November 6th.—Present: 10 members and visitors.

Mr. J. B. Harris (Orchard Instructor and Inspector for the district) attended the meeting and delivered an address, "Laying Out the Farm Garden." Mr. F. C. Richards, of the Department of Agriculture, was also present and spoke on the work of the Agricultural Bureau.

PROFITABLE FARMING.—At a further meeting held on November 27th, Mr. F. Schmidt read a paper dealing with this subject, in which he said that in many cases a small farmer held the opinion that farming was not a profitable undertaking unless the whole of the farm was under crop or fallow. That method of managing a small holding was evidently not the most profitable, because past experience had proved that the land would not stand continual wheat cropping. The majority of farmers in that district, and in many other districts also, frequently had to face the fact that their average wheat crop yield was about 10 bush. to 15 bush. to the acre, whereas it should be from 15 bush. to 25 bush. The question then arose, "Is there no remedy for this continued low yield?" Mr. Schmidt mentioned that he had given a good deal of attention to that

question during recent years, and he had come to the conclusion that the land required a rest and a change of crop to keep it in good heart and condition for wheat-growing. A change to barley, oats, and peas would improve the land. The small land holder had to consider how he was to give his land a spell and a change of crop. It was advisable to subdivide a small farm into four or five equal portions, which would make it possible for the farmer to rest the land, and also give it the needed change of crop. The practice of sowing barley, oats, or peas on stubble land had proved very satisfactory. To fallow a paddock, then crop it with wheat, followed by barley, and then give the land a rest, took a period of four years, and if the farm was divided into five paddocks it would throw each paddock out for two years' grazing, which would be a profitable proposition. It was also advisable after a paddock had had a rest of, say, one or two years to fallow the land and work it thoroughly until November. In most cases fallow land did not receive sufficient working up till that time, and it did more harm than good to be stirring the land during the summer months. The only work which it was advisable to do during the summer was to use the harrows or the roller after a shower of rain. A fair quantity of seed and super should always be applied; seed from 1½ bush. to 2 bush. per acre and super from 1cwt. to 2cwt. Heed should be given to the time of seeding. Many people were of the opinion that putting in stubble ground did not pay, but in a large number of cases the stubble ground was sown at the most unsuitable time. In average years the best results were generally obtained from a crop sown after the first rain either at the end of April or the beginning of May. The first sown crops generally proved to be the best either on stubble or fallow ground. An interesting discussion followed.

BLACK SPRINGS, November 23rd.—The November meeting took the form of a "Question Box," when a number of subjects of local interest were brought before members for discussion.

WESTERN DISTRICT.

ROBERTS AND VERRAN.

November 22nd.—Present: 10 members and three visitors.

ADVANTAGES OF THE AGRICULTURAL BUREAU.—The following paper was read by Mr. M. Masters:—"The Agricultural Bureau has been established for 37 years, and has proved beneficial to all interested in agriculture. It stands for the promotion of agriculture. Every settler on the land should be a member of the Bureau. Every producer is liable to success or failure, and should want to know the reason of either, if he is to help develop the country. Bureau meetings should be held regularly. Papers should be read and discussed, and every member should take part in the discussion. Every member of the Bureau should conduct experiments and make the results known to his fellow-members. Government experimental farms are established to help the producers, and it is through the Bureau that they are able to obtain the results of the work on those farms. Every member is entitled to a copy of the *Journal of Agriculture*, thus enabling him to obtain expert knowledge. Expert officers of the Department of Agriculture visit Branches of the Bureau and deliver addresses and answer questions, which are very helpful to the man on the land. A debate on some subject of agricultural interest makes an interesting meeting and helps members to become good public speakers. The Bureau also enables the man on the land to get into closer touch with the Department of Agriculture." In the discussion that followed, Mr. A. T. Cowley thought the suggestion that members should conduct experiments and make the results known a good one. The fact that members were in touch with the departmental officers was also a great advantage to those engaged in agricultural pursuits. Mr. B. Evans suggested an occasional homestead meeting to maintain interest in the work of the Branch.

FARM TRACTORS.—Mr. D. Jonas read the following paper:—"The agricultural tractor on the farm has advantages over horses in working the land, because the work can be done more quickly and with less expense to the farmer. With the tractor there is not the loss of time that there is in feeding and preparing horses for the day's work and in changing teams or stopping work for one and a half

hours at dinner time to give the horses a feed. The land that would have to be put in for feed can be used for some other suitable crop, with less haycarting, stacking, and chaffcutting, and there is less water to conserve or cart, which means time to the farmer. I do not say horses could be entirely dispensed with on the farm, because one team could be used for carting and assisting in drilling and harrowing. The tractor could take the place of the stationary engine for chaffcutting, wood sawing, and pumping water." The following schedule of costs of working a tractor was then quoted by Mr. Jonas:—"Ploughing 100 acres, the tractor used 112½galls. kerosene, which cost £8 18s. 1d.; cost per acre, 1s. 9d. Drilling 100 acres, 52½galls. kerosene, £4 3s. 1d.; cost per acre, 10d. Harrowing 100 acres, 28galls. kerosene, £2 4s. 6d.; cost per acre, 5½d. Total cost, £15 5s. 8d. In a few years more tractors will be used for farming, because there is no doubt that the tractor has proved that it can take the place of horses for hauling and all general purposes." In discussing the paper, Mr. G. Smith considered the tractor to be much better than horses, but did not think that horses should be dispensed with altogether. On an ordinary-sized farm about eight or 10 horses could be kept for the lighter work, such as drilling, stripping, &c., and the tractor used for ploughing and stationary work. Mr. H. Smith thought if a tractor could be worked as cheaply as stated by Mr. Jonas it would mean a great saving when compared with horses. A few horses should be kept, however. A tractor could be used for chaffcutting, winnowing, &c., and would be more satisfactory for that work than an ordinary engine. Mr. W. Whittaker said that a six or eight horsepower stationary engine would cost about the same as a tractor with 22 horsepower at the pulley. However, he did not think the time was ripe for doing all the work on the farm with a tractor. He pointed out that a small tractor would cost about the same as 10 good draught horses, and a couple of foals could be bred every year to keep up the strength of the team, and in 10 years that would mean 20 horses, whereas the tractor would probably be worn out by that time. Mr. H. Lewis considered a tractor would be very useful on a farm, but he thought a few horses should be kept. Much time would be saved when the horses were feeding. A tractor could be worked longer hours than horses if necessary. Mr. C. Simmons thought that in time to come the tractor would take the place of horses. The cost of working was less and there was a great saving in time. Mr. C. Masters considered a tractor a very handy implement for the farmer. He preferred a small tractor, because it could be used for a greater variety of jobs than a large one. Mr. H. Simmons said a tractor was a very useful implement for a man commencing work on a scrub block, because it did away with water-carting, &c. It was also handy for stationary work. Mr. A. T. Cowley said it had been stated that tractors could not be worked profitably, because both the tractors and fuel had to be imported, but he held the opinion that tractors would do more work than horses. If he were starting again he would use a tractor and have his implements sized accordingly. An eight horsepower tractor was a handy size. It would pay to standardise the power and size of implements, &c. He mentioned that it was often stated in favor of tractors that time was saved through not having a team to feed at midday, but he found an opportunity while the horses were feeding to do small repairs to the implement which was in use. Mr. G. Smith asked how tractors compared with horses for road haulage. Mr. C. Simmons stated that with rubber grips the tractors compared favorably with horses. Mr. B. Evans thought a tractor would be very useful for auxiliary power, but he would not care to rely on it entirely. It would be handy for speeding up the work at seeding and fallowing time. Mr. M. Masters said although the working costs of the tractor and horses were about equal, one great advantage of the horses was that they could be bred from, and thus keep up the strength of the team, whereas with the tractor it meant paying for another one in about 10 years.

YADNABIE (Average annual rainfall, 14.09in.).

October 23rd.—Present: 13 members and visitors.

The report of the delegates to the Annual Congress was received and discussed. A report of the tractor trial that had recently been held at Lipson was given by Mr. J. J. Deer.

QUESTION BOX.—The meeting held on November 20th took the form of a Question Box. In discussing the question, "What capital do members consider necessary to start farming in new mallee country?" Mr. G. W. Jericho said the

question was one which depended on the experience that a man had to his credit. Where one man could start with £100 another would not be able to start with £1,000. Mr. W. L. Brown advocated starting on the share system. In his opinion a man required from £300 to £400. Another member said £500 was the least with which a man could start farming, but he would have to be very careful and understand the work to make a success of the venture. "Will oats grow as prolifically after a heavy crop of wheat as after a light crop of wheat?" Messrs. Brown and Spriggs thought oats would do better after a heavy crop of wheat because the stubble fire tended to lighten the soil.

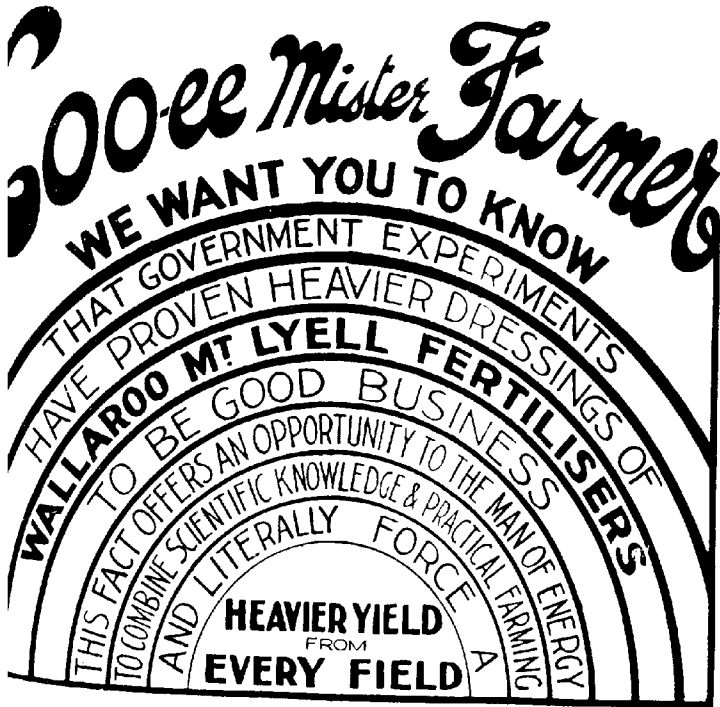
BUTLER, October 22nd.—Visitors and members of the Butler Branch of the Agricultural Bureau, to the number of 60, met at the residence of Mr. C. F. Jericho on October 22nd and inspected the experimental plots being conducted by Mr. Jericho. Mr. R. Hill (Manager of the Minnipa Experimental Farm) was present and delivered an address, "Experimental Work on Eyre Peninsula."

EASTERN DISTRICT.

COONALYPN (Average annual rainfall, 17.49in.).

November 23rd.—Present: 11 members and five visitors.

LARGE *versus* SMALL HOLDINGS.—Mr. C. T. George spoke on the advantages to be gained by cropping comparatively large areas as against concentrating on a small scale. He instanced the cases of men cropping 150, 250, and 500 acres respectively, giving an estimated expenditure for plant, &c., and the ultimate yield



showing in favor of the man cropping the largest area. He thought that larger implements might be used, and more land brought under cultivation, the bushes being easily kept in check with a "Sundercut" cultivator. He thought it more profitable to aim at getting a medium average over a large area than to work for a very high average over a small cropping. Several members disagreed with the idea, considering it too risky. Other items of local practice were also discussed.

LONE GUM AND MONASH.

November 21st.

THE DRYING OF FRUIT.—The following paper was read by Mr. L. A. Chapple:—
 "In preparing dried fruit for market the grower or orchardist should aim at producing an article of the best quality, because this only will enable us to hold our own in the oversea markets. Local markets have long since been over-supplied, and the days are past when haphazard methods of fruit-drying will be accepted. With the keen competition that exists, the public demands a high-grade fruit, and unless the grower produces what the public require, fruitgrowing will not be a profitable undertaking. It is well to remember that the production of dried fruit does not commence on the drying green, but much before this stage is reached. In the first place, select land that will suit the particular class of fruit you intend to grow. See that it is well drained, because it has been proved in all the irrigation settlements that drainage is one of the first essentials in the production of fresh or dried fruit. Next, see that the best varieties are planted for drying. Obtain trees from a reliable nurseryman, where you can be reasonably certain of securing trees worked on good stocks, true to name. Pay attention to spraying, so that the fruit is not damaged by insect and fungus pests. Prune, water, and manure intelligently, and then when the fruit comes to maturity, exercise care in harvesting. Much good fruit is spoilt, either by allowing it to become over-ripe, or by picking it in too green a condition. Fruit is often allowed to fall to the ground and become sunburnt, bruised, or dirty, and then gathered and placed on the drying-tray with sound, well-ripened fruit picked off the trees. Such fruit can only produce a second grade article, and it is a serious mistake on the part of the grower to think that it can be placed with a first class article and sold for top prices. The fruit will be sold according to sample, and the buyer will purchase according to the lowest grade in that sample. Fruit is no longer graded according to size alone; color and cleanliness have become important factors in determining the top-grade article. This is as it should be, and the grower should exercise special care in sorting out inferior and windfall fruit before it is placed on trays. Such fruit, if it is dried, should be kept in separate sweat-boxes and packed separately. The apricot is one of the best known dried fruits, and requires harvesting immediately it ripens, otherwise it falls to the ground, and owing to its soft condition, squashes in the sand and is spoilt. The trees should be inspected every other day, and the fruit picked when fully ripe though still firm. The most popular way of dealing with apricots is to split them, though they may be dried whole. I do not, however, recommend the latter method, because in the past much inferior fruit has been placed on the market, either very small fruit which has been considered too costly to split, or under-sulphured fruit which has a very unattractive appearance. These two factors are largely to blame for the public disfavor of the whole-dried apricot. The split apricot is placed on trays, split side up. Care should be taken to make a clean cut, because jagged edges tend to spoil the appearance of the fruit. The trays of fruit are then placed in the sulphur house, and sulphured until the cups are full of juice. The amount of time to be allotted for this process is largely controlled by the weather. Fruit will sulphur more quickly in hot weather than in cold weather; but, as a general rule, eight hours will be sufficient to treat the fruit. The amount of sulphur to be used is again determined by the size and condition of the sulphur house. The size of the surface of the receptacle in which the sulphur is placed also has much to do with the amount of sulphur to be used. As a guide, I would suggest about 3 lbs. of sulphur in a house containing up to 100 trays. The sulphur can be placed in tins and strips of hessian put down through it to act as wicks. When this is done the fire is not so likely to smother. The sulphur is easily set alight with a match or a small live coal. All the air should not be excluded from the sulphur house. When the fruit is taken from the sulphur house it should be spread on the drying green

until it is about half dry. Then it can be stacked and drying completed in the stack. Great care should be taken not to put the fruit out in a fresh condition if the weather is windy. On such days all trays should be stacked with a couple of empty trays at the bottom to prevent the fruit being spoilt by dust and sand. If the trays are placed on the bare ground, it will be found that rubbish and sand will stick to the bottom of the trays by means of the juice which has run out of the fruit. To overcome this difficulty and where suitable drying greens have not been provided, strips of wood (bamboos answer the purpose admirably) should be placed in double rows and the trays rested on them. The fruit should be taken off the trays before it becomes too dry, and placed in sweat-boxes to allow the moisture to return to an even temperature. If the fruit is to be dried whole, it should first be placed in a dip tin, then dipped in a boiling lye made by adding 1lb. of caustic soda to 20galls. of water, and immediately after the bucket of fruit should be plunged into cold water. This is to prevent the skin breaking and the fruit becoming squashy. The lye cracks the skin sufficiently to allow of quick drying, whilst the cold water sets the skin sufficiently to prevent rubbing off through scalding. The fruit is then placed on the flat on trays, sulphured, and then spread in the sun to dry in the usual way. It is most important to place the fruit on the side, otherwise a nice flat appearance cannot be obtained, and the fruit will be irregular in sample. The peach and nectarine are dealt with in a similar manner to the apricot. Peaches are split and require more sulphur than apricots. They should be sulphured until the cups are full of juice or until the fruit has a cooked appearance. If under-sulphured, a dark color will result. Nectarines are treated in a like manner, only that it is possible to whole-dry the clingstone varieties in the same manner as whole-dried apricots. Pears are picked as soon as they are fully colored, though still quite green. The time to gather can be determined by giving the fruit an upward lift. If the fruit is ripe, the stem breaks away freely. The fruit should be handled carefully so that it does not become bruised, and be placed in boxes and packed away from the light. It will soon ripen, and when soft should be cut in two from end to end, placed on trays with the cut side facing upwards, and sulphured. This fruit requires a lot of sulphur, and after treatment, unless it is quite soft and presenting a cooked appearance, it should be sulphured again. When the fruit is thoroughly sulphured, it should be placed in the sun for a couple of days, then stacked, and the drying completed in the stack. *Prunes.*—This fruit should be very ripe when gathered. It should then be placed in dipping-tins and immersed in boiling lye, made by placing 1lb. of caustic soda into 20galls. of water. It then should be dipped into cold water to harden the skin, and spread on trays to dry. If the weather is hot, I recommend shade drying. The fruit when taken off the trays should be allowed to sweat for about a fortnight, after which it should be put through a glossing dip made in the following manner:—To 20galls. of water add 1lb. of glycerine, 1lb. of salt, and 1lb. of wattle gum. Boil the mixture and immerse the fruit in dipping-tins for a few seconds, after which it should be spread on trays to dry. It will dry in a few hours, and can then be graded and packed. When drying light-colored plums—such as Jefferson or Golden Drop—the fruit should be sulphured after the caustic dip, and then finished off in the sun in the same manner as apricots. *The Currant.*—Here again care should be taken by the picker not to mix poor or unripe fruit with fruit of a good quality when placing it on the racks. Inferior fruit so mixed will lower the grade and result in a loss to the grower. The fruit when picked should be thoroughly ripe and immediately spread on the rack. Currants should be shade-dried on a completely enclosed rack. If the rack has an iron roof, which is no doubt the best, side-curtains can be erected, thus completely excluding the sun's rays, which tend to make the fruit red in color. When the fruit is nearly dry it should be rubbed off on to hessians, the prongs of a pitchfork being the best implement for this work. The fruit then should be spread out in the sun to complete the drying process. It should be sweated for some time to allow for the evening-up of the fruit. Care should always be taken not to box up fruit whilst it is still hot from the rays of the sun. Currants are sometimes dried on trays, and in this case they should always be stacked when the weather is hot otherwise they become sunburnt and the fruit becomes red in color. The Lexia, Gordo, or White Melaga, when picked, is dipped in boiling lye, made by adding 1lb. of caustic soda to 15galls. or 25galls. of water. It is then spread on the racks to dry, or if trays are used, spread directly in the sun. If the fruit is spread on trays, it should be

turned about the third day. This is done by placing an empty tray on top of the one filled with fruit, then two men, one at each end of the tray, turn it over, leaving the fruit respread on the new tray. If the fruit is dried on racks it should be rubbed off on to hessian as soon as sufficiently dry, finished in the sun, and then sweated for some time to allow for the evening-up of the moisture in the fruit. The Sultana.—There is more difference of opinion as to the method to follow in drying the sultana, perhaps, than in preparing any other fruit. The fruit should be thoroughly ripe before being picked. It then should be dipped in boiling lye, made by adding 1lb. of caustic soda to 25galls. or 30galls of water, and then spread on the rack or on trays to dry. The same process as described for the Gordo Lexia is carried out to complete the work. While I recommend a lye of 1 in 25 or 1 in 30, it is necessary for the grower to make his own tests as to strength, because fruit differs according to soil, and no doubt there are different qualities in caustic soda. When the dip is made the correct strength, very small cracks should appear in the skin of the berries. A bunch immersed before dipping starts, and exposed to the air for a few minutes, will show very tiny cracks around the stem end of the berry. The dip can then be considered the right strength. It should be the aim of the grower to obtain dried fruit showing a nice golden color."

RAMCO.

November 19th.—Present: 17 members and four visitors.

During the afternoon an inspection was made of the orchards of Messrs. E. Hunter and F. Lewis. In the evening the usual meeting was held. Mr. C. Boehm tabled a cinctoring knife made from a watch spring. In connection with the pruning competitions the chairman (Mr. C. Boehm) presented a medal to Mr. W. Perry for gaining top place in Gordo section with 93 points, and certificates to Messrs. W. G. and A. Perry. The meeting then discussed several points of interest that had arisen during the homestead meeting.

RENMARX (Average annual rainfall, 10.93in.).

November 15th.—Present: 25 members and six visitors.

THE SCIENCE OF IRRIGATION.—The following paper was read by Major Toller, D.S.O. (Chief Engineer of the Renmark Irrigation Trust):—"It is impossible to treat this important subject comprehensively in one evening, but I wish to emphasise a few points and will welcome criticism and do my best to reply to questions. There is a tremendous agitation throughout the fruitgrowing districts at present towards lessening the costs of packing and selling the produce. Is it not equally important to cheapen production by increasing the yields and quality of fruit to the acre? The average yield of dried sultanas along the Murray does not exceed half a ton per acre, yet every settler who is giving proper attention to irrigation is averaging over a ton. Thirty hundredweight is not an over-ambitious average to aim at. My object is to describe the action of water artificially applied to the soil, point out the dangers and limitations, and describe the ideal at which all fruitgrowers should aim. Water occurs in soils as hygroscopic, capillary, and gravity water. You have noted the power salt has to absorb moisture from the atmosphere. All soils have this hygroscopic power, soils rich in humus absorbing much more than poor soils, but even the richest soils cannot absorb sufficient moisture from the atmosphere to support plant life. Capillary water exists as a thickened film of water around each soil particle and partially fills the spaces. This water cannot be removed by drainage and through the peculiar attraction that soil and water have for each other, the water moves in every direction. Capillary water rises higher in fine textured soils than in coarse soils, but it moves much more rapidly in the latter. In a comprehensive series of tests it was found that capillary water rose 17in. in six days in light sandy soils, but no further; but it rose 46in. in 195 days in clay soils before becoming stationary. It will at once be seen that with young vines or trees whose roots have not had time to penetrate deeply that the clay soils will not require so frequent irrigations as the sandy soils. Further careful tests have been made to ascertain the maximum amount of hygroscopic and capillary water various soils will hold to a depth of 8ft. and the following results were obtained:—Clay soil, 19 per cent. by weight; loamy soil, 16 per cent. by weight; very sandy soil 14 per cent. by weight. Gravity water is that water which moves downwards through the soil pores because of gravity. It first of all satisfies the hygroscopic

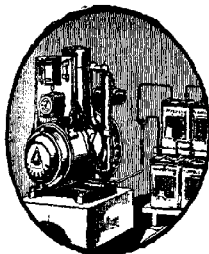
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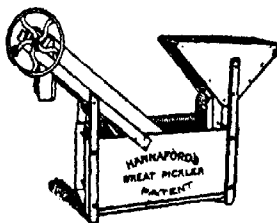
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and capillary capacity of the soil and then collects on top of the first impervious stratum it reaches and is the cause of many of our troubles. The pores in soil vary from 30 per cent. for sandy to 60 per cent. for clay soils. For the best plant growth air and water should be in equal amounts, as water is purely the conveying agent of plant food, while the air is the chemical agency through which the plant food is rendered available, and it is also indispensable to the life of the myriads of bacteria, worms, ants, spiders, &c. which enrich the soil. The minimum amount of moisture in the upper 4 ft. of soil on which various fruits can subsist is as follows:—Apricots and olives, 8 in.; citrus and figs, 14 in.; almonds and prunes, 14 in.; walnuts and grapes, 2 in. These figures, however, are apt to be rather misleading for old-established orchards, as no note has been made as to the root growth below 4 ft. Strange to say, vines will penetrate as deeply as any deciduous trees in well-drained soil and have frequently been found 26 ft. to 24 ft. down, and even citrus roots penetrate 6 ft. to 8 ft. For deciduous trees and vines permanent water must not approach within 7 ft. Capillarity renders the next foot saturated. Unfortunately, a very great area of our irrigation lands, even those artificially drained, have permanent water closer to the surface than 7 ft., and under our primitive methods of draining it is too costly to cut drains deeper. Until we are prepared to stand the expense of having a geological survey of our substrata made, and of obtaining mechanical drain excavators, we shall never achieve any really great results in our under-drainage schemes. Soils very seldom have less than 8 per cent. of water in the first 8 ft., which is equivalent to a depth of slightly over 9 in. of water. Water applied to the soil is used for plant transpiration, evaporation, percolation, and run off. The evaporation from saturated soil exceeds the evaporation from a water surface, and draws the salts to the surface. There is an all-too-prevalent habit of flooding land instead of confining the water to furrows. This practice cannot be justified, except on extremely sandy soil, or on any soil where deep drainage has just been provided, and it is desired to drive the salts down into the drains. Flooded lands always dry out sooner than furrowed lands, because the water seals the ground and destroys the bacteria and other life in the soil, thus preventing Nature's system of mulching. A fermentation of the vegetation is set up and toxic poisons formed. Portions of the land furrow irrigated are trying out for mulching, but have to be neglected because the flooded land is too wet to work. Many settlers complain that their land is too hard to furrow out. Any soil that is in that state prevents the proper spread of roots in the dormant period. No settler can expect payable crops unless his soil is in good tilth because trees and vines are never idle, and in the winter are busy extending their roots. Unless the irrigation water is dangerously saline, all orchards should be irrigated in the autumn and ploughed deeply and planted to cover crops. Unless all the soil is thoroughly watered, the roots will only draw upon a limited portion of the soil for their food. The aim should be to make the roots penetrate all the soil. It is impossible to estimate exactly how far percolation extends. The only sure method is by testing, which is comparatively easy. The gimlet end is cut off a 2 in. auger and the shaft is cut, the end being thickened and threaded to fit inside a 1 in. pipe socket. A few 2 ft. lengths of pipe are cut and the handle end of the auger shaft is also threaded to fit a 1 in. pipe socket. A spoke makes an excellent capstan for turning the boring plant and lifting it out. By examining the core, it will soon be seen whether the irrigation has effectively soaked all the soil. If it has not, a longer soaking or closer furrows are necessary, or a dressing of gypsum may prove valuable. When head ditches are placed too far apart the water at the upper end of the furrow percolates beyond the reach of the roots and takes much of the plant food with it. Besides a big waste in pumping, it may aggravate the drainage problems, too, by augmenting the subsoil waters. While head ditches take up ground, an even watering of the orchard will more than compensate for the loss of area. Again, the horticulturist will put you on the right track. A very common system of watering adopted in California is as follows:—The orchards are furrowed transversely to the slope and then down it, and the furrows are then opened out. This is a very effective system on steep sloping grounds. For very sandy soils the American system of ridging up a square around each tree and flooding same rapidly and then shutting off has much to commend it, but is very laborious. I feel sure that with the proper application of water, three irrigations are sufficient for all crops except citrus; that is purely for the maturing of the crops. But, it

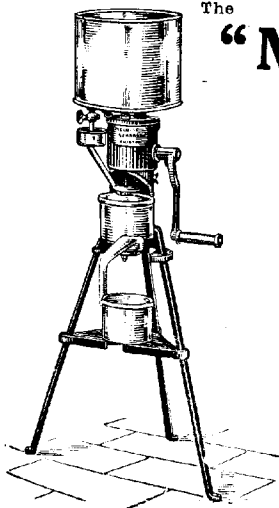
addition, commencing from the first year's planting, a cover crop should be provided. Unless heavy rain falls by the middle of April, an extra irrigation should be taken. In a winter such as the one just experienced, when no soaking rain occurred, an early watering, not later than the middle of September, should be provided, so that the cover crop can be ploughed in deeply. This deep ploughing is essential, because it gives the top soil a thorough aeration and sweetening, and it places the cover crop at sufficient depth for the maximum number of bacteria to attack it and render it available in its constituent chemicals for plant food. By turning in the cover crop so early, the equinoctial winds are generally avoided, and following on the autumnal ploughing the ground should break up into a very fine tilth. If showers occur, the soil requires a very light stirring to re-establish the mulch. Land that has been kept in good heart and not cropped without manuring nor over-irrigated with the resulting loss of humus, will not require another irrigation until well into October. To my mind, this is the most important irrigation of the season. The foliage has not grown sufficiently to provide much protection from the wind or sun and it is essential that the water be confined to the furrow, so that the land can be cultivated as soon as possible. The second general watering is hard to arrange, as a compromise has to be made with the apricot growers. Were it not for them, I think the first week in December would be early enough to commence. Again, channels to supply the water economically, currants should first be watered just before the picking commences, then sultanas, and last of all Gordos. It would undoubtedly mean higher water rates, but far less working of the blocks, and the avoidance of specials at the time of the year when the water is charged with deleterious chemicals. Unfortunately, there is so much inter-planting that we shall always have to muddle along, suiting comparatively few, and not getting by any means the best results. Apart from the number and dates of waterings, on which we shall never reach unanimity, undoubtedly the greatest troubles

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this area is beset with are over irrigation, the flooding over the surface of the soil, and insufficient deep cultivation. To the man starting an orchard or vine yard, my advice is 'Do anything rather than skimp grading.' Secondly, 'Remember that Nature has provided for the natural production of herbage and trees, and that by the application of water you are upsetting the balance; therefore, start immediately with the production of humus.' Thirdly, 'Air in the soil is equally important as water to sustain the life of the bacteria, therefore furrow deeply to avoid flooding and the consequent drowning of the bacteria.' Fourthly, 'Sample the soil with an auger until you have learnt exactly how much water you require to thoroughly moisten the top 4ft. of soil, and the proper distance to place your furrows apart.' Finally, 'Remember that water is only the conveying agent of plant food, but without it nothing grows, so never neglect to provide a good mulch in order to keep the moisture handy to the roots.' While the roots of the trees and vines may penetrate to a depth of 8ft. or 10ft., the first 4ft. of soil provide the most plant food, as pure air is essential to the health of the bacteria, and the deeper one goes the less change of air takes place.' At the conclusion of the paper the chairman called for questions or discussion. Mr. W. J. Connolly asked whether salt was more frequently found in mallee land than in box country. Major Tolley said the question of salty land was one with many problems. The planting of mangels was good; couch grass also took up salts. The question of watering under the vines or in furrows was one for individual decision. He thought it better to water down the centre of the row. Mr. Connolly said it was a Mildura practice to water under the vines, and Mr. Basy remarked that on one patch of vines he used the syracuse hoe and kept the water away from the centre. Major Tolley considered that deep drainage was the only true solution, and that it should be done on a proper plan. He was in Fresno in 1912, where 40,000 acres had gone out through seepage. A geological survey was made as a first condition in order to concentrate the drainage, and then drains 2ft. in diameter, with laterals, were put in and reclaimed the whole land, the vines were restored and made wonderful progress. After the drains were in, the area was banked up and the whole area flooded to drive the salt into the drains. The benefit of subsoiling was advocated by several speakers, and Major Tolley said that on one block at Block E he had found a hard clay bed only 1in. below the surface. Some ground which he had found hard to break with a pick had been trenched and now took as much water as he could pour on it. Mr. L. Darrington asked what was a fair depth for drainage, and Major Tolley said a soil auger was needed to find out how the clay subsoil lay, and so discover whether the drains could lie on it. As a general rule about 7ft. was needed. At the Berri Experimental Orchard a contour plan was made showing the clay beds. America generally claimed to be years ahead in her methods, but had made a serious mistake in Nevada, where the water was led into a big reservoir, and let out on the land, which was subdivided into 80-acre blocks, and it was found that clay dykes were running diagonally across the fields, and in three years the whole area went out—salt could be scooped up with a shovel. He was a great believer in green manuring; with chemical manures it was sometimes open to doubt if the proper constituents were being used, but with green manure there could be no mistake. If the cover crop was hard to turn in, run over it with a straight set disc first. In reply to Mr. Geneste, Major Tolley said he would not recommend flooding at any time.

BERRI, January 7th.—The Deputy Horticultural Instructor and Manager of the Berri Experimental Orchard (Mr. C. G. Savage) attended the meeting and delivered an address, "Preserving Fruit," to an excellent attendance of members and visitors.

COOMANDOOK, November 14th.—The annual Farmers' Drive of the district was held on November 14th, when the manager of the Kybybolite Experimental Farm (Mr. L. J. Cook), accompanied by a large number of members and visitors, inspected the holdings of Messrs. Chapman, Ninnis, Plew, Le Gallez, Trestrail, Cox, Davis, and Williams. In the evening Mr. Cook delivered an address, "Grasses and Fodder Crops," to an audience of 20 members and 18 visitors.

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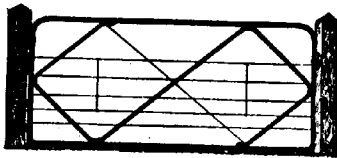


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COONALPYN, January 18th.—Mr. Cronin read a paper, "Farm Buildings," that had been prepared from notes obtained at the 1923 Winter School for Farmers, and an interesting discussion ensued.

GLOSSOP, December 21st.—Mr. James gave a short address, "Comforts and Conveniences on the Block," and an interesting discussion ensued.

KRINGIN, January 3rd.—The inaugural meeting of the Kringin Branch of the Agricultural Bureau was held at Mr. G. Guthleben's residence on January 3rd. Seven members attended, and the Acting Secretary (Mr. F. C. Tee) briefly explained the aims and objects of the Agricultural Bureau. Officers and a programme committee were then elected.

SOUTH AND HILLS DISTRICT.

BALHANNAH.

December 21st.—Present: 27 members.

POTATO GROWING.—The following paper was contributed by Mr. V. Spreen:—
 "In selecting seed potatoes care must be taken to have seed of the best quality, free from all diseases, with a smooth skin and good shape. If imported seed is desired I prefer selecting Victorian potatoes of prime table quality. If this is done there is less danger in growing potatoes from run-out stock, which some growers are too willing to pass out as no good to them. If saving your own seed potatoes select the best part of the bed for seed, and when digging save the best potatoes for seed. I prefer potatoes that are dug from black loam for planting on red land and *vice versa*. From experience, it does not pay to plant your own saved seed always, hence a change of seed is necessary. Never save seed from a poor crop. When the seed potatoes are received they should be emptied out of the bags at the first opportunity, and spread out as thinly as possible, about two or three potatoes thick. I prefer storing the seed in a loft on bare boards, where they will not be affected with hot weather, and where they have plenty of light. Both ends of the loft should be left open. Light is the main factor in making the seed as green as possible. The greener the seed is made the sturdier the shoots will be, and the will also be less liable to rot if rain falls after planting. When the top potatoes are green and beginning to shoot, take a narrow tined fork and turn the potatoes over, bringing those on the bottom to the top, in order to make them thoroughly green. Turning the seed in this way will check over-development of the shoots on the lower layers of potatoes. Great care must be taken not to injure or break off the shoots at any time in turning. If the seed is ready for planting, and the land not ready or the weather unfavorable for planting, turn the potatoes again at intervals of a week or so. Plough the ground intended to carry the potatoes about 3 in. or 4 in., about July or August, if weather conditions are suitable. Under circumstances must the ground be worked if it is too wet. In ploughing bury the grasses. Harrow the ground twice and allow it to lie until September, then use the cultivator, harrows, and roller, and finally work the plough to a depth of 6 or 7 in. If the ground is inclined to be cloddy, first use the roller, then the harrow and then the roller. Cultivation of the land before planting is most important and if the land is not in good condition, delay the planting until it is in good order, otherwise good results cannot be expected. Land can be worked better before planting than after. When planting, take the seed potatoes out in boxes using a fork to fill the boxes. Handle the seed very carefully in order not to damage or break off the shoots. When cutting large potatoes, allow two eyes each set, and then place them into the bucket used for planting. Never tip the seed out of one bucket into the other for fear of rubbing off the shoots. I find it better to cut the potatoes as they are required for planting. Plough to the depth of 4 in. for planting. Deep planting is often the cause of irregular crops. If a horse is made to walk on the land the potatoes can be placed on the bottom of the cultivated soil and in the centre of the furrow. Make the ploughing as straight as possible, taking a 9 in. furrow and planting every third furrow. The manure should be applied on the land just before planting, using about 8 cwt. to 10 cwt. to the acre. Super and bonedust have given the best results. As soon as the

potatoes are planted, harrow and roll the soil to make an even surface and conserve moisture. When the potatoes are just showing above the ground or have made up to 90% growth, harrow them with a pair of steady horses, taking care not to allow the horses to tread on the bushes. Cultivate with the horse-hoe about a fortnight later, setting the cultivator or horse-hoe as wide as possible without injuring the bushes. Use a very steady horse for the first scarifying. If weeds become prevalent, or heavy rains fall, another scarifying will be necessary. If the second scarifying is performed set the scarifier to cut a narrow strip of soil, so that the fibrous roots of the plants are not injured or disturbed. If the crop is irrigated do not give the plants too much water at once, or there will be a danger of causing the tap-roots to rot. A little and often is the best plan to adopt when watering. So soon as the skin of the potato has set, watering must immediately be discontinued; if not, the consequences are that the potatoes will grow 'nobby.' Never plant potatoes more than twice in succession on the same ground, otherwise the development of diseases will be encouraged."

CYGNET RIVER.

November 20th.—Present: seven members.

LUCERNE GROWING.—The following paper was read by Mr. H. L. Moar:—
 "To raise a crop of lucerne successfully one must obtain good reliable seed. Preparing the land is a very important step, and requires considerable care and perseverance. Rich sandy land is most suitable, because of its naturally loose nature and because of the heat. From land of this class about two good cuts

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more are obtained than from the heavier soils. Lucerne flea causes more damage on the heavy soils. The land must be ploughed and reploughed, harrowed, rolled, and graded, the latter requiring skill and patience, because if it is intended to irrigate by gravitation, and the land is not properly graded, trouble is sure to follow. Well-graded land is also necessary for mowing the crop when it is matured. Then comes the planting of the seed; some like planting in late autumn, while others favor spring sowing. Owing to the fineness and lightness of the seed, some growers make a practice of mixing it with sand and broadcast it carefully, whilst others mix it with super and sow it through the drill. The rate of sowing varies from about 5lbs. to 12lbs. per acre. Do not sow too thinly, because a thin crop will not make a high growth. As soon as the crop is high enough to cut, it must be mowed. Some feed off the crop, but that is detrimental to the plant if it is required to stand for years. The first cut must be made as soon as the lucerne is high enough; if this is not done, the first crop does not grow quickly and checks the following crops. After this the matter of cutting each successive crop requires due attention. When the crop is about one-third in bloom, or when young shoots are showing at the bottom of the plants, no time should be lost in putting the mower into the crop. For the man who irrigates, the portion just cut must be immediately flooded if he wishes to obtain maximum returns from the plot. It is a good plan to broadcast super after each cut. Each season, in the very early spring, or just before the growth commences, the lucerne should be well harrowed. You can hardly work it too much. Work the plot east and west, north and south, and diagonally—in other words, from all points of the compass. It is also beneficial to add from 1wt. to 2cwts. of super during the cultivation operations."

CYGNET RIVER.

December 18th.

TOMATO CULTURE.—The following paper was read by the Hon. Secretary (Mr. F. J. Wakelin):—"The successful cultivation of tomatoes on a commercial scale requires a good deal of thought and attention, from the time the seed is planted in the bed until the crop is picked. I find that good rich loamy sand, such as we have on the river flats, is most suitable for the growing of tomatoes. First, the land should be thoroughly ploughed to a depth of 6in. or 8in. about six weeks harrowed six to eight times. The climatic conditions that prevail on the island before planting, and during that time it should be reploughed, cultivated, and enable the careful grower to produce tomatoes to perfection without irrigation. The raising of good, strong, sturdy plants is very important, and this means the careful preparation of the seed-bed. Early in the season the bed should be covered with glass to provide shelter and to force growth. As the plants make headway they can be uncovered. When a large area is to be devoted to tomatoes, it is not always possible to procure enough stable manure, therefore I recommend an application of guano super or bonedust dug into the soil around each plant. In good land, and where the tomatoes are likely to make strong growth, the rows should be 6ft. apart and the plants 2ft. apart in the rows. This will enable a two-horse team to be used for cultivation, but as the bushes spread out it will be necessary to work a smaller cultivator. Transplanting, which is usually done in November and December, is a delicate operation on account of the hot weather. It is better to wait for a cool change, and if it rains, so much the better. In taking up the plants from the bed do not injure the roots, and the same care must be taken when planting out. After a few days a few plants will, in all probability, have died. These gaps should be filled in as soon as possible. After all the plants are established, keep the land well cultivated, especially after every rain. When the bushes are flowering the double flowers, which usually form on the top of the bushes, can be pinched off, because they only produce wrinkled tomatoes, which are useless. The Early Dwarf is a very good variety for early planting, and for later planting many different kinds can be recommended." The discussion which followed was interesting, after which exhibits tabled by members brought forward interesting comments.

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HARTLEY (Average annual rainfall, 15in. to 16in.).

November 20th.—Present: 10 members.

Mr. J. M. Hudd gave an interesting address, "Advantages of the Milking Machine."

WEEDS AND RABBITS.—At a further meeting held on December 19th Mr. N. L. Whellar, in the course of a paper, "Things We Don't Want on the Farm," alluded to the spread of boxthorn, and whilst admitting that kept under control it made a good hedge and breakwind, he said it was a source of annoyance when it spread in the paddocks. When the boxthorn became a nuisance he suggested that the plants should be pulled out by the roots with the aid of a horse and then stacked and burnt. Prickly pear was also a troublesome plant. To deal with the pears effectively he advised rooting up the plants and then stacking them on old bushes ready for burning. Mr. Whellar considered the star thistle one of the worst weeds of the district, and as they were not yet very plentiful in that locality, he urged every landholder to spare no efforts in destroying the plants. As a means of dealing with the thistles he advised digging up the plants just before the flowering stage, and then either burning or burying them. Many methods were used to try to keep rabbits under control, but he believed the most effective plan to be that of smoking out the burrows. The plan he adopted was to cover a piece of old bagging with tar, push it down the burrow, and then set fire to the bag. When the tar was thoroughly alight, the hole should be closed in. To make certain that the job had been effective, the burrows should be inspected every day for a week, and any holes that had been opened should be filled in. It was also advisable to muster any sheep that were pastured in paddocks in which rabbits were present, before smoking out the warrens. That would have the effect of driving most of the rabbits into their holes.

KANGARILLA.

November 23rd.—Present: 12 members and three visitors.

DAIRYING.—The following paper was read by Mr. R. Guthberlet, a farm applanter from England:—"The first point to be considered in the successful management of a dairying proposition is the provision of accommodation for the cows. It is not necessary to go to the expense of erecting a shed of a specified type almost any shed, providing it is large enough, can be converted into a good cow-house. The building must be well drained, lighted, and efficiently ventilated, otherwise the health of the cows will be affected, and there is the constant danger of contaminating the milk. When providing for light to enter the sheds, care must be taken that the sun cannot shine directly upon the cattle. Have a passage of at least 4ft. 6in. behind the cows, and also a gutter, so that after the bails are washed they will be thoroughly drained. A good plan is to concrete or plank the floor. This will make a better job of it, and save much time and labor. The floor should be washed after each milking, and if water is laid on, the tyres can be hosed. The walls should be whitewashed at least twice a year. It will be found that if a small quantity of fat or grease is added to the whitewash it will adhere to the walls. Have a bail for each cow if possible, and a box or trough, so that the animals can feed in comfort whilst being milked. Do not bring the cows in with a dog, or use sticks to place them in their bails. More good can be accomplished by kindness than by force. The latter only excites the cows and reduces the milk supply. Milk regularly, and space the milking periods as near to 12 hours apart as possible. Anything that tends to upset the regular order of a cow's day reflects itself in the milk pail. Give the cows eight weeks' rest before calving, and do not forget to feed them generously during this time. If she calves in poor condition, she will not make a good show at the market. It may not be practicable to groom all the cows thoroughly daily, but it is quite feasible to keep the flanks clean and free from cakes of dried manure. When turned out to grass, cows should have access to a good supply of fresh, clean water. Wheaten chaff is the best feed to give cows in the winter. Lucerne and Sudan grass are capital summer fodders. The latter should be sown about November and the lucerne in March or September. One of the best methods to ensure the quality of cream is to keep the separator clean and free from dirt. If

dirt is allowed to accumulate in the bowl of the machine or in various parts, it will taint the cream. The separator collects many of the impurities of milk, and unless great care is taken, these germs and other kinds of refuse will find their way into the cream. The separator should be washed thoroughly after each time of using. It is also a recognised fact that a separator that is thoroughly clean will skim more closely than one which is dirty. It is a good plan to flush out the bowl with clean water after each separation while the machine is still running, and until the discharge from the skim milk spout is clear. This will remove most of the particles of milk and cream which stick to the separator parts, and will enable the subsequent washing of the machine to be done more easily. The bowl should then be taken apart, and all parts scrubbed with a brush and hot water, to which has been added some good washing powder. The parts should then be well rinsed with scalding water and allowed to drain in a clean place. In choosing cows, it is advisable to select a type of cow which is suited for the climate and district. The Jersey-Shorthorn cross I consider the type of cattle suited for this district. A desirable dairy cow should be deep through the chest and have a wide spring of ribs. This chest cavity contains the heart and lungs, and in order to do their work properly they must have ample room. The shoulders should be fine, and free from any coarseness. The vertebrae should be very open from the shoulders along the back and free from flesh. This would not be the case with dry cows that would soon freshen, nor in heifers that are below the milking stage. A great change very frequently takes place in the structure of the shoulders during the first lactation period. The neck should be clean cut and fine, neatly attached to the body, and free from any coarseness of superfluous flesh. The head should appear fine, the veins standing out prominently on the face, with the head free from any 'meatiness.' The eyes must be large and bright and full, and the nostrils very wide. The animal should have a large broad mouth and a clean powerful jaw. The head should be clean cut, showing intelligence and temperament. I prefer an udder of which the attachment to the body is both long and broad, coming up well behind and joining the body smoothly in front. The bottom should be level, and the teats of medium size, placed well apart and squarely upon the udder. I like to see an udder that is covered with a network of prominent veins. When milked out, the udder should be soft and pliable and free from any indication of 'meatiness.' In a good cow the milk veins are long, crooked, and branching, entering large and easily discovered openings. Veins that are long and branching are much to be preferred to shorter heavier veins. In superior animals a well-defined middle vein is often noticed. The hide should be soft, pliable, and covered with soft, fine hair. In the discussion that followed, one member stated that cows could be kept clean by using clippers and clipping round the udder and flanks. Some members considered that one bail for each cow was unnecessary, and when a large herd was kept it meant keeping a very large plant. When on muddy land it was a hard matter to keep the teats free from dirt. In the case of a cow being blown, Mr. G. Connor stated that he had effected a cure by puncturing the side of the cow with a penknife. Another method was to place about 4ft. of small hosing down the throat of the animal. Another member did not favor crossbred cows, because that meant the keeping of two distinct herds to produce the cross, and there was a danger of getting a "heefy" cow.

MOUNT PLEASANT (Average annual rainfall, 26.87in.).

December 14th.—Present: eight members.

CATTLE FOR THE SMALL LANDHOLDER.—In the course of a short paper dealing with this subject, Mr. E. J. Tanscott first gave an informative description of the Milking Shorthorn, Illawarra Shorthorn, Hereford, Avshire, and Friesian cattle. The Jersey he considered to be the most profitable cow for the small landholder. The cows were very quiet, rich creamers, and kept in milk over a lengthy lactation period. Being smaller cows than some of the other breeds, they did not require so much feed. The contention of some people that the Jersey cow was a delicate animal was hardly correct, because he had kept Jersey cattle right through the winter without rugging, and he held the opinion that if the cows were kept in good

condition they did not require rugging. There was, however, one disadvantage—i.e., the bull calves were not worth rearing, unless sold for stud purposes. In the discussion that followed, Mr. Vigar favored the dual purpose type of Shorthorn cows for the Mount Pleasant district.

BLACKHEATH, December 21st.—Mr. W. J. Pym read an instructive paper, "How to Improve Pasture Lands," to a gathering of 10 members and several visitors.

CHERRY GARDENS, December 22nd.—Fourteen members and approximately 90 visitors, including delegates from the Blackwood, Kangarilla, McLaren Flat, Longwood, and Iron Bank Branches, attended the December meeting of the Cherry Gardens Branch, which took the form of a social evening. Musical and literary items and addresses, followed by supper, concluded a most enjoyable evening.

CYGNET RIVER, January 22nd.—Mr. A. C. Osterstock read extracts from the Departmental Bulletin, "Tillage of the soil," and a keen discussion followed.

KANGARILLA, December 21st.—The Vice-Chairman of the Advisory Board of Agriculture (Captain S. A. White, C.M.B.O.U.) visited the Branch and delivered an address, illustrated with lantern slides, "Across Australia by Motor Car."

A further meeting was held on January 17th, when the question of preparing a Bureau exhibit for the Meadows Agricultural Show was discussed.

LONGWOOD, November 24th.—On Saturday, November 24th, members met at Mr. R. H. Lewis's residence and took the opportunity of inspecting the orchard and garden. An interesting paper from the *Journal of Agriculture*, "Rotation of Crops," was read by the Hon. Secretary (Mr. J. R. Coles).

TWEEDVALE, January 24th.—The Assistant Dairy Instructor (Mr. H. J. Apps) inspected the dairy herds of Messrs. E. Dearman and A. Sickerdick during the afternoon, and in the evening delivered an address, "The Dairying Industry," to a gathering of 17 members and three visitors.

SOUTH-EAST DISTRICT.

ALLANDALE EAST.

December 14th.—Present: seven members.

WINTER AND SUMMER GARDENING.—In the course of an address dealing with this subject Mr. A. Kieselbach explained at length the preparation of the soil for winter and summer gardening, the most suitable kinds of vegetables to plant, and the correct time of planting. In winter the garden should be prepared on the driest and warmest ground, provision being made for adequate shelter. The land should be heavily manured with stable manure or super. The preparation of the vegetable plot should be taken in hand immediately after the first rains. After the vegetables had been sown, thinning out was necessary in order to secure crops of good quality. In preparing for a summer garden, a site in an exposed locality should be chosen. If manure was used he preferred bone super. He planted melons and pumpkins 6ft. apart, and in the following order:—Watermelons, pumpkins, piemelons. Piemelons and watermelons should never be planted alongside each other, but pumpkins should separate the melons. In the discussion that followed, Mr. C. Griffin said pumpkins had formed on his vines, but had made no further development after reaching the size of a tennis ball and sometimes smaller. Mr. Kieselbach considered that it was due to the poorness of the soil. Mr. W. Laslett thought such a defect would be caused by imperfect inoculation. It was a good plan to inoculate the female flowers from the male. He had also found that pumpkins did better in the same ground each year if the soil was well manured. Mr. Kieselbach mentioned that if the ground was used every alternate year better results would be obtained. Mr. Butler said the manure of

the previous year was by then decayed, and supplied more plant food. Mr. C. Griffin asked, "What are the best pumpkins for this district?" Mr. Kieselbach recommended Iron Bark and Turk's Head. Mr. W. Laslett had found fowl manure the best for the garden.

POULTRY BREEDING.—In the course of a paper dealing with this subject, Mr. E. Jennings said White and Brown Leghorns were the best layers and they did not consume so much food as some of the larger breeds of poultry. Black Orpingtons were poor layers, but they were very useful for brooding purposes. The birds should be kept away from the house, and not allowed near the stack, because they scratched the seed and hay about. In a great many cases barley and oats were fed to the birds. That was a mistake, because those cereals were not easily digested and were also difficult for the birds to swallow. If, however, the barley and oats were crushed, they made a very suitable food, provided there were no long threads left on the seed. Wheat was the best grain for feeding. Shell grit should always be available in the pens for the birds. It was advisable to have early broods, say the last week in August or early in September, so that the pullets would commence laying early in the new year, about March or April. If that were done, eggs would be obtained through the winter. When sitting the hen, it was advisable to obtain eggs about a week old, and to sprinkle them with a little cold water. Young chickens should be kept in the coop for a few days, until they became strong and healthy, and in the meantime dry oatmeal should constitute their food. They should also be kept warm and dry, with plenty of clean water to drink. It was also essential that the pens be kept clean. When building a fowl-house, room was the most essential point to keep in mind. An enclosure 36ft. by 36ft. would provide plenty of space for the fowls. The front of the yard could be enclosed with 1½in. mesh wire-netting. Cutting grass made a good covering for the roof, because it provided for a supply of fresh air. Iron roofs were too hot and did not allow the necessary fresh air to reach the birds. In all cases it was most necessary to keep the fowl-house clean. The drinking utensils should also be cleaned every day, and fresh water given to the birds. Perches should not be built higher than 2ft., and they should be rubbed down every three or four days with kerosene. Laying boxes should be of a fair size, so that the hen would not be cramped. The sitting hen should be on the ground, away from the other birds, so that it would not be disturbed. Cabbage leaves when tied in a bundle made a good picking for the birds, as also did potato and apple peelings. After two years' service the flock should be culled and all aged birds fattened and sent to market. An interesting discussion followed.

KALANGADOO (Average annual rainfall, 33in. to 34in.).

December 8th.—Present: nine members.

TOP DRESSING PASTURES.—The Hon. Secretary (Mr. W. J. EVANS) read the following paper:—"This is a branch of farming that is becoming more general every year, and, in my opinion, holds out great possibilities for the South-East. Practically any class of land can be improved by a top dressing of at least 1ewt. of super every fourth year. Although one of the latest settlers in the district, I have, from the first year that I took up land, been using super on grass land. My first experience was on an eight-acre block that had been sown the previous summer with millet and Sudan grass and grazed up to the end of May. After the winter rains I noticed there was a good patch of clover showing on this block, but it was not making much headway, and in August I decided to give it an application of super. The manure was applied at the rate of 1ewt. to the acre, with the discs of the drill set well into the ground. The result was wonderful, for almost immediately increased growth could be observed. I then decided to save this paddock and cut it for grass hay, and at the end of November I obtained 14 two-horse wagon loads off eight acres. The crop consisted almost wholly of Schanck clover, and did not appear to be in the land before it was top-dressed. This stack of hay was a great help to me in the winter months for feeding the cows

when there was very little other fodder available. After I had carted the hay there was a fair amount of feed in the paddock, and it was grazed through the summer months. The following season it was the earliest paddock of feed on the property, and six weeks after the first rains I put cows in that paddock, and it carried more stock for the rest of the year than any 25 acres on the farm. This year again it was one of the earliest paddocks, and is still showing the effect of the super, but it needs breaking again now and another dressing of super. The following year I top-dressed 15 acres of virgin land, and although it made good growth and stood out well from the other half of the paddock that was not treated, it did not show such marked growth as the land that had been broken the previous year. This year I dressed another 40 acres and noticed that where the land had been broken, such as rabbit warrens that had been filled in, and on fire breaks, the growth is far superior to that on unbroken land. Stock will graze on land dressed with superphosphate until the grass is almost eaten out by the roots and allow grass on land not fertilised to go to seed. This year I sowed about five widths of the drill around a paddock with super and left the centre untouched. Whenever a visit was made to the paddock the stock were always feeding around the fence, and now one can almost follow the last drill mark. I do not think it matters what time of the year super is applied to the land, so long as it is not left until too late in the season. I would, however, prefer August or September, because that would force the grass just when it started to grow. A good rotation would be first year oats, second year super and a cut of grass hay, third year grazing, and plough again for oats in the fourth year. I would apply 1 cwt. of super every third or fourth year, rather than put on a heavier dressing and leave the land for an indefinite period. I have proved to my own satisfaction that top-dressing pays, because it gives more feed, better feed, and healthier stock, which means a bigger profit and less worry to the farmer." An interesting discussion ensued.

MOUNT GAMBIER (Average annual rainfall, 32in.).

December 8th.

An instructive paper, "Milk Fever," was contributed by Mr. G. Hill, and a keen discussion followed.

NARACOOORTE (Average annual rainfall, 22.60in.).

November 10th.—Present: 11 members.

BINDERS AND BINDING.—With memories of haymaking before the days of the binder still in mind, Mr. C. Bray read a paper entitled "Binders and Binding," mentioning that he looked upon the binder as one of the "greatest pieces of harvesting machinery ever invented." To ensure its smooth running there were many parts which required close attention. The main driving chain was, of course, the pivot upon which all the other machinery depended, and once that went wrong it put all the others out of action. The knotter was another essential part. There was nothing more annoying to the driver than to see loose sheaves being tossed out, especially if he could not find the cause, which was very often a puzzle to unravel. The least little thing would often cause it. Sometimes just a turn of a nut with the spanner would remedy it. At other times the tongue of the knotter would become spread through a gripping knot in the twine; closing it slightly with the pliers would rectify the trouble. "I find it a good plan to take notice of any parts that are getting worn when finishing up the season while they are fresh in one's memory, so that they can be attended to before starting another season," he concluded. An interesting discussion followed. Mr. W. Loller, whose harvesting experience had gone back to the days of the scythe, the grass-mower, and the old side-delivery machine, regarded the modern binder as a great improvement. Mr. E. S. Alcock mentioned that the successful working of the binder depended greatly on the farmer's understanding of the machine; he became accustomed to the one he used and usually preferred it to other makes for that reason.

